Section 3.1

Geology, Soils, and Seismicity

Data Sources

This section is derived primarily from the HWRP EIR/EIS (Conservancy 1998), which was based on previous geotechnical investigations and environmental studies performed within the HAAF main airfield parcel and adjacent coastal salt marsh. Previous studies included:

- Hamilton Wetland Restoration Project Final EIR/EIS (Conservancy 1998),
- Geotechnical Investigation Bel Marin Keys Unit 5 (Miller Pacific Engineering Group 1995),
- Bel Marin Keys Unit V Final EIR/EIS (Environmental Science Associates 1993), and
- Draft Hamilton Wetlands Conceptual Restoration Plan (Woodward-Clyde 1998).

Environmental Setting

Regional Geology and Topography

The project area is located within California's geologically and seismically active Coast Ranges Geomorphic Province. The province is characterized by a series of northwest-trending faults, mountain ranges, and valleys (Environmental Science Associates 1993).

Two distinct geomorphic zones, the Bay Plain and Franciscan Uplands zones, occupy the project site. The Bay Plain extends from the edge of San Pablo Bay to the foot of the hills immediately west of the HAAF parcel. Adjacent to San Pablo Bay, the nearly level site consists of former mudflats and marshlands that have been separated from tidal action by dikes and levees since the early 1900s; the site is drained by a system of trenches and pumps (Robert Bein, William Frost & Associates 1995). After its removal from tidal action, the soil became desiccated and began to settle below its original elevation. Current ground

elevations at the site range from +7 to –7 feet National Geodetic Vertical Datum (NGVD), with a typical ground elevation of –5 feet (Woodward-Clyde 1998).

A thin near-surface crust of desiccated soft marine clays known as bay mud covers the area, although in the HAAF main airfield parcel, the surface crust also consists of several feet of granular fill and pavement in the former runway and taxiway areas. The project area is underlain by bay mud to depths that vary from 70 feet near San Pablo Bay to 30 feet or less at the northwestern end of the site. The water table is typically several feet below the surface and varies somewhat seasonally.

Soils

Soils on the project site consist primarily of naturally occurring clays, clay loams, and gravelly sandy loams. On the lower, developed portions of the HAAF area, natural soils have been extensively disturbed by grading, fill placement, and construction of buildings and paved areas. Three soil types are present:

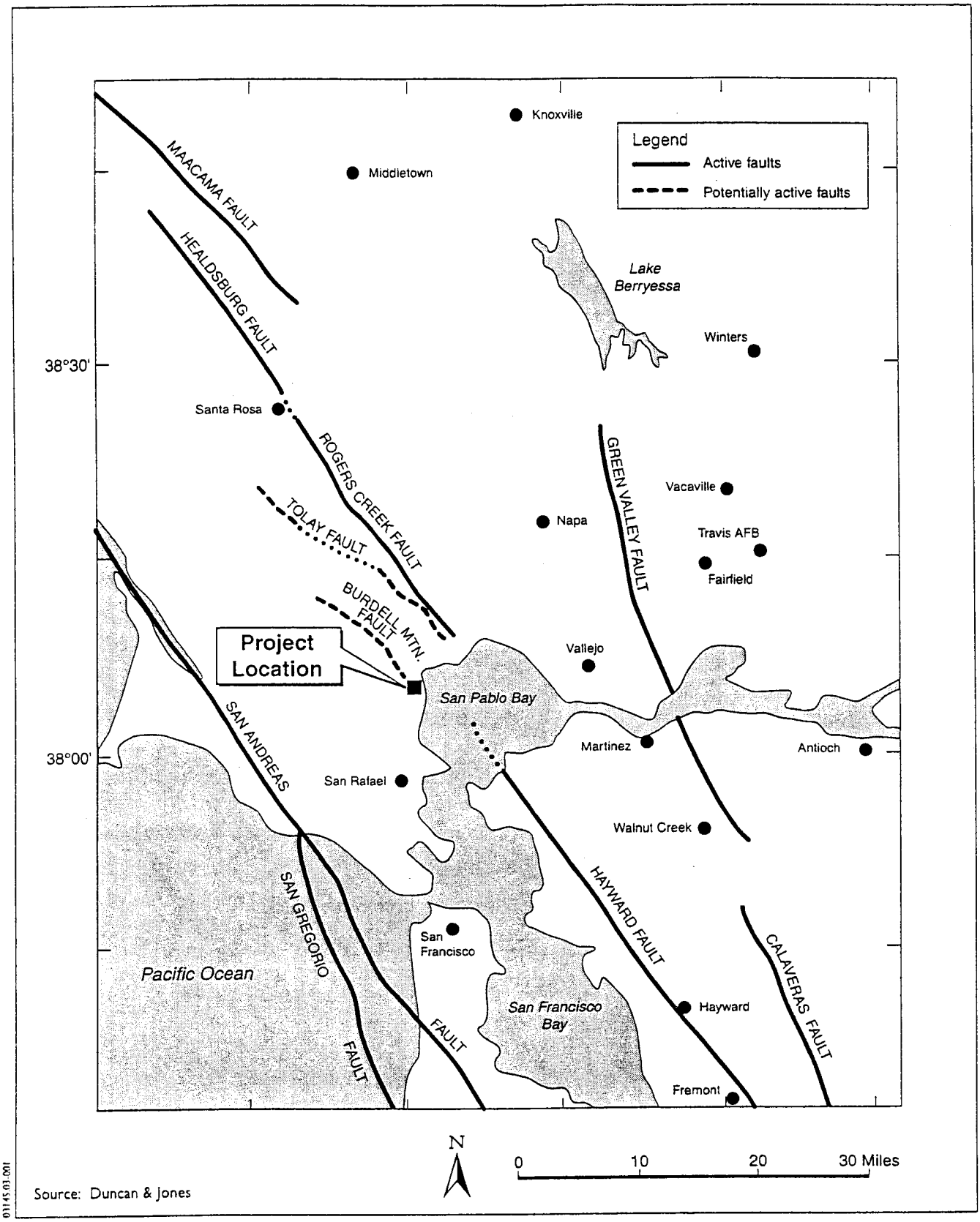
- Saurin Urban Land Bonnydoon,
- Xerorthents-Urban Land, and
- Xerorthents.

The Saurin series is a clay loam over sandstone bedrock. The Bonnydoon soil is a gravelly loam, and the Xerorthents type is used to describe the highly variable, disturbed urban flatlands. Surrounding areas contain Cortina gravelly sandy loam (industrial park area to the north) and Reyes clay (St. Vincent's Silveira Landholdings to the south). The native Novato soil series is now present in the HAAF area only in the salt marsh east of the levee (Robert Bein, William Frost & Associates 1995).

In addition to the three naturally occurring soil types, local upland soil material has been placed as fill ranging in depth from several inches to several feet. This fill has been compacted over extensive areas of Reyes soil, under the roadways and parking pads, and as berms extending into vegetated areas. The fill material is variable but is commonly a reddish-brown, very gravelly, sandy clay loam, which is typical of subsoil material from any of the four major upland soil series in the area (U.S. Army Corps of Engineers 1996).

Seismicity and Geologic Hazards

The project area is located in one of the most seismically active regions in the United States. The seismic setting of the project site is dominated by the Hayward fault to the southeast, the San Andreas Fault to the west, and the Healdsburg-Rogers Creek fault to the northeast (Figure 3.1-1).



Source: Duncan & Jones

01145.03.001

Jones & Stokes

Figure 3.1-1
Regional Faults

The maximum credible earthquake for each of these faults, measured in Richter scale magnitude (M), is as follows:

- Hayward fault—7.5 M
- San Andreas fault—8.3 M
- Healdsburg–Rogers Creek fault—7.2 M

Two smaller, potentially active faults are near the site. A possible trace of the Burdell Mountain fault is mapped as extending toward and terminating north and west of the site. Estimates differ regarding the date of the last displacement on the Burdell Mountain fault. It is generally thought to have been active during the Quaternary period (the last 2.5 million years), and some evidence suggests that it may have been active during the Holocene epoch (the last 11,000 years) (Environmental Science Associates 1993). The Tolay fault also reaches to within 6.5 miles of the site and may be active (Robert Bein, William Frost & Associates 1995).

The project area is likely to undergo ground shaking from a major earthquake. The U.S. Geological Survey has estimated a 67 percent probability that there will be one or more earthquakes of magnitude 7.0 or greater in the Bay Area in the next 30 years (Environmental Science Associates 1993).

Four major hazards are associated with earthquakes: ground shaking, surface fault rupture, ground failure, and inundation resulting from earthquake-generated waves (tsunamis or seiches). These are described below.

Ground Shaking

Factors that would affect the intensity of ground shaking in the project area during an earthquake on a nearby fault include

- characteristics of the fault generating the earthquake,
- distance to the fault and earthquake hypocenter,
- earthquake magnitude,
- earthquake duration, and
- site-specific geologic conditions (i.e., the nature of the geologic materials underlying the site) (Miller Pacific Engineering Group 1995).

Unconsolidated materials tend to amplify ground shaking to a greater extent than bedrock. Accordingly, ground shaking during an earthquake would likely be more intense at the site than in nearby areas underlain by bedrock.

Surface Fault Rupture

No active or potentially active faults are known to exist within the boundaries of the HAAF. HAAF is also not within an Alquist–Priolo Special Studies Zone, as designated by the California Division of Mines and Geology (Hart and Bryant 1997). Accordingly, the potential for surface fault rupture to occur in this area is remote (Miller Pacific Engineering Group 1995).

Ground Failure

Ground-failure hazards of potential concern at the site include liquefaction, earthquake-induced settlement, and lurching. All of these processes involve the displacement of the ground surface resulting from a loss of strength or failure of the underlying materials because of ground shaking.

Liquefaction is the sudden loss of soil strength during strong ground shaking, which results in temporary fluid-like behavior of the affected soil materials. Liquefaction typically occurs in areas where groundwater is shallow and materials consist of clean, poorly consolidated, fine sands and silts. The bay mud deposits that underlie the HAAF are not conducive to liquefaction because they do not contain substantial quantities of clean sands and silts (Miller Pacific Engineering Group 1995).

Ground shaking can also induce the settlement of loose, granular soils (e.g., clean sands and silts) located above the groundwater table. The bay mud deposits that underlie the site consist of clays and silts rather than clean sands. Thus, there is no potential for seismic settlement at the site (Miller Pacific Engineering Group 1995).

Lurching, or lurch cracking, is the cracking of the ground surface in soft, saturated material as a result of earthquake-induced ground shaking. Lurch cracking generally occurs along the edge of steep embankments where stiff soils (e.g., manufactured fill materials) are underlain by soft, compressible soils and geologic deposits (Miller Pacific Engineering Group 1995). Because the HAAF site is underlain by soft, compressible bay mud deposits, potential exists for earthquake-induced lurch cracking to occur during an earthquake, particularly where deposits are bordered by steep channel banks or adjacent hard ground. (Environmental Science Associates 1993.)

Earthquake-Induced Inundation (Tsunamis and Seiches)

Tsunamis are sea waves produced by large-scale seismic events on the ocean floor. Seiches are earthquake-generated waves that form in enclosed water bodies, such as lakes or tidal marshes. Both can cause temporary inundation of

upland areas. Because of its proximity to San Pablo Bay, the project site may be affected by tsunamis and seiches.

A tsunami with a 100-year recurrence interval (i.e., a 1 percent probability of occurrence in a given year) has an estimated run-up of 3 feet near the site. Likewise, a seiche generated in the vicinity of the site is expected to be relatively small (less than a few feet) (Miller Pacific Engineering Group 1995). At its current elevation, the HAAF main airfield parcel could be flooded by a tsunami if the existing outboard levee fails or is overtopped (Environmental Science Associates 1993).

Environmental Impacts and Mitigation Measures

Approach and Methods

The following evaluation of potential geologic, seismic, and soil-related impacts associated with site remediation was based on a review of geotechnical reports prepared for HWRP and for developments in and immediately adjacent to the site. The evaluation incorporates the professional opinions rendered in these reports as well as professional judgment.

Impact Mechanisms

The impacts associated with remediation activities would be similar to impacts for construction activities. Impacts would primarily be related to loss or degradation of soils on the site, or modifications to the site that could result in personal injury; loss of life; or substantial damage to property, structures, or related improvements. For the HWRP, existing levees where excavation or other activities may occur would be the principal feature that could be affected by ground-disturbing activities proposed in the ROD/RAP. The ROD/RAP activities would be temporary and would not result in the permanent location of structures or people in a seismically active area.

Thresholds of Significance

The following significance criteria were used to evaluate the proposed actions contained in the ROD/RAP. Regarding geology, soils, and seismicity, the proposed project would have a significant impact if it would

- result in substantial soil erosion or sedimentation; or
- cause personal injury, loss of life, or substantial damage to property, structures, or site improvements as the result of geologic, seismic, or soil-related hazards that would be *created* during the remediation of the site.

Impacts and Mitigation Measures of the Proposed Project

Impact G-1: Potential Short-Term Increase in Erosion and Sedimentation Rates during Construction. Although the erosion hazard throughout the site is slight under normal conditions, ground disturbance associated with remediation activities would expose bare soil to erosion by water and wind and could increase erosion and sedimentation rates above preconstruction levels. Several sites proposed for excavation are adjacent to area water bodies, including San Pablo Bay, outfalls into the Bay, or the PDD. Due to the nature of the contaminated soils on the site and the location near sensitive receptors, control measures to prevent contaminated sediment from migrating into surrounding water bodies would be required. Control measures for sedimentation associated with the remedial actions are addressed in Section 3.2, "Water Resources." This impact would be *less than significant* due the minimal erosion hazard on the site and implementation of control measures described in Section 3.2.

Impact G-2: Potential Damage to Levees Resulting from Remedial Activities. Remediation at several sites would occur on and adjacent to the northern and eastern levees. Excavation would occur on the levee slopes themselves, and excavated soil would be loaded onto trucks on top of the levee. The levees are constructed on bay mud, which is structurally weak. Removal of soils on the levee or levee aprons or weakening of the levees from large, loaded trucks driving on them, may stress or weaken the levees and lead to failure. Slope stability would be particularly critical in the future when the outboard levee is breached as part of the HWRP and the area is inundated, providing additional external force on levees. Factors influencing slope stability include strength of natural soils and fills, embankment heights and slopes, and depth of inundation. The severity of seismic shaking, in conjunction with the above factors, also affects slope stability.

To ensure the stability of levee slopes is maintained, the ROD/RAP assumes the following.

- Smaller trucks will be used to move soil from sites along the levees to a staging area, where soil will then be transferred to larger transport trucks.
- All soil excavations would be backfilled with suitable material.

Stability of levees would also increase under the HWRP implementation as a result of construction of new levees, reinforcement of existing levees, and consolidation and settlement of material placed within the levees.

This impact is considered *less than significant* because measures incorporated into the ROD/RAP are adequate to ensure the levees will not be compromised and because subsequent design of the levees under the HWRP will minimize the potential for slope failure.

Section 3.2

Water Resources

Environmental Setting

Data Sources

The evaluation of water quality effects is based on the ROD/RAP, the 1998 EIR/S for the HWRP, source documents for that document, as well as other sources that include:

- San Francisco Bay Plan (San Francisco Bay Conservation and Development Commission 2001);
- Regional Toxic Hot-Spot Cleanup Plan (San Francisco Regional Water Quality Control Board 1999);
- Draft – Beneficial Reuse of Dredged Materials: Sediment Screening And Testing Guidelines (San Francisco Regional Water Quality Control Board 2000);
- Report of the San Francisco Airport Science Panel (National Oceanic and Atmospheric Administration 1999);
- San Francisco Bay Region–Water Quality Control Plan (San Francisco Regional Water Quality Control Board 1995); and
- Joint Stormwater Agency Project to Study Urban Sources of Mercury, PCBs, and Organochlorine Pesticides. Final Report. (Kinnetic Laboratories Incorporated 2002).

Regulatory Setting

Federal Plans, Programs, and Policies

Clean Water Act

The EPA has granted the State of California primacy in administering and enforcing the provisions of the Clean Water Act (CWA) and the National Pollutant Discharge Elimination System (NPDES). NPDES is the primary federal program that regulates point-source and nonpoint-source discharges to waters of the United States.

The State of California adopts water quality standards to protect beneficial uses of state waters as required by Section 303 of the CWA and the Porter–Cologne Water Quality Control Act of 1969 (PCWQCA).

Placement of clean fill materials into waters of the United States is regulated by Section 404 of the CWA, which is administered by the Corps. Under the CWA, the state RWQCB must issue Section 401 Water Quality Certification or a waiver for a project to be permitted under Section 404. Water quality certification requires the evaluation of water quality considerations associated with dredging or placement of fill materials into waters of the United States.

State Plans, Programs, and Policies

The McAteer–Petris Act of 1965

The McAteer–Petris Act, enacted on September 17, 1965, established the San Francisco Bay Conservation and Development Commission (BCDC) as a temporary state agency charged with preparing a plan for the long-term use of the Bay (Bay Plan). In August 1969, the McAteer–Petris Act was amended to make BCDC a permanent agency and to incorporate the policies of the Bay Plan into state law.

Any person or governmental agency wishing to place fill, extract materials, or make any substantial change in use of any water, land, or structure within the area of BCDC's jurisdiction must secure a permit from BCDC. Upon receiving an application for a major permit, BCDC will transmit a copy of the application to the San Francisco Bay RWQCB and certain other Bay resource and regulatory agencies. Within 30 days, the RWQCB must file a report with BCDC that indicates the effect of the proposed project on water quality within the Bay. BCDC must take action on a permit application, either denying or granting the permit, within 90 days after a complete application is filed. The permit will be automatically granted if BCDC fails to take specific action within that time period.

A permit will be granted for a project if BCDC finds and declares that the project is either (1) necessary to the health, safety, or welfare of the public in the entire Bay Area; or (2) of such a nature that it will be consistent with the provisions of the McAteer-Petris Act and the provisions of the San Francisco Bay Plan then in effect. The main requirement of the Commission's law and policy is to minimize fill in the Bay and maximize public access to and along the shoreline. The Commission also has policies relating to water quality, Bay wildlife and habitat, and other aspects relating to conservation and development of the Bay as a regional resource.

BCDC also administers the federal Coastal Zone Management Act (CZMA) for the Bay segment of the California coastal zone. Federal agencies must submit a determination regarding the consistency of their proposed activities with BCDC's federally approved coastal management program, which is based on BCDC's law and policies. BCDC will then either concur with or object to the consistency determination.

The Porter–Cologne Water Quality Control Act of 1969

The PCWQCA established the State Water Resources Control Board (SWRCB) and divided the state into nine regional basins, each with a regional WQCB. The SWRCB is the primary state agency responsible for protecting the quality of the State's surface and groundwater supplies. The San Francisco Bay RWQCB has jurisdiction over the project area.

The PCWQCA authorizes the SWRCB to draft state policies regarding water quality. The PCWQCA requires that the SWRCB or the RWQCB adopt water quality control plans (Basin Plans) for the protection of water quality. A Basin Plan must

- identify beneficial uses of water to be protected,
- establish water quality objectives for the reasonable protection of the beneficial uses, and
- establish a program of implementation for achieving the water quality objectives.

The basin plans also provide the technical basis for determining WDRs, taking enforcement actions, and evaluating clean water grant proposals. The RWQCB adopted the most recent Basin Plan in May 1995.

In addition, the PCWQCA authorizes the RWRCB to issue Cleanup and Abatement Orders (Site Cleanup Requirements) and Waste Discharge Requirements (WDRs) for discharges that pollute or threaten to pollute surface or groundwater.

California Regional Water Quality Control Board—San Francisco Bay Region

Water quality in streams and aquifers of the region is guided and regulated by the California RWQCB, San Francisco Bay Region. The RWQCB has primary authority for ensuring that water resources are protected from degradation by pollutant discharges. The State Policy for Water Quality Control aims to achieve the highest water quality consistent with the maximum benefit to the people of the state.

To develop water quality standards that are consistent with the uses of a water body, the RWQCB attempts to classify historical, present, and future beneficial uses as part of the Basin Plan. Beneficial uses of the major rivers and groundwater basins, along with narrative and numerical water quality objectives, are established in the Basin Plan for the region (San Francisco Regional Water Quality Control Board 1995). The Basin Plan is periodically reviewed and updated pursuant to PCWQCA.

The USEPA has also promulgated freshwater and saltwater criteria for 126 priority pollutants (13 heavy metals, asbestos, and 112 organic compounds) in the National Toxics Rule. The California Toxics Rule was adopted in May 2000 and supersedes the National Toxics Rule in California for most pollutants. The RWQCB is currently amending the Basin Plan to address the water quality objectives promulgated in the California Toxics Rule.

The RWQCB is required to identify water bodies that do not meet water quality objectives pursuant to Section 303(d) of the CWA. Existing beneficial uses of San Pablo Bay include: commercial and sport fishing; estuarine habitat; industrial service supply; fish migration; navigation; preservation of rare and endangered species; contact and non-contact water recreation; shellfish harvesting; fish spawning; and wildlife habitat. Additional beneficial uses are defined for other waterbodies in the region, such as Novato Creek. No existing beneficial uses of groundwater are defined for the project area.

The Basin Plan has adopted the following objectives, which may apply to the proposed wetland restoration, to protect water resources.

- Waters shall not contain biostimulatory substances in concentrations that promote aquatic growths to the extent that such growth causes nuisance or adversely affects beneficial uses.
- Waters shall not contain chemical constituents in concentrations that adversely affect beneficial uses.
- Waters shall be free of discoloration that causes nuisance or adversely affects beneficial uses.
- No pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses.
- Discharges shall not result in pesticide concentrations in bottom sediment or aquatic life that adversely affects beneficial uses.

- Persistent chlorinated hydrocarbon pesticides shall not be detectable in water within the accuracy of the analytical methods approved by the USEPA.
- The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses.
- Waters shall not contain suspended materials in concentrations that cause nuisance or adversely affect beneficial uses.
- Groundwater shall not contain chemical constituents in concentrations that adversely affect beneficial uses.

The Basin Plan also restricts increases in water temperature and reduction of dissolved oxygen concentrations, especially in water bodies supporting cold-water aquatic organisms.

Site Cleanup Requirements

The RWQCB follows policies and procedures in State Board Resolution No. 92-49, "Policies and Procedures for Investigation and Cleanup and Abatement of Discharges Under Water Code 13304," for addressing cleanup of pollution threatening or impacting groundwater, or from recent or historical surface spills, subsurface releases, and all other unauthorized discharges that pollute or threaten to pollute surface or groundwater. Under Water Code 13304, the RWQCB can issue cleanup and abatement orders (site cleanup requirements) to address investigation, remediation, and cleanup by a discharger.

Waste Discharge Requirements

The San Francisco RWQCB establishes WDRs to protect those beneficial uses identified in the Basin Plan. Beneficial uses protected by the Basin Plan that would be applicable to the proposed site remediation include wildlife and fish habitat, estuarine habitat, and preservation of rare and endangered species. In establishing WDRs, the San Francisco RWQCB considers the potential impact on beneficial uses within the area of influence of a discharge and the existing quality of receiving waters based on the appropriate water quality objectives.

WDRs issued for a project based on water quality objectives may contain more- or less-restrictive conditions that take into account factors such as economic considerations in addition to actual and potential beneficial uses. Because San Pablo Bay is considered a "water quality limited segment" in the Basin Plan, more stringent water quality objectives and treatment levels could be required for any discharge to this area. WDRs typically address turbidity, suspended solids, and other water quality issues. The RWQCB will issue WDRs to address placement of dredged sediments on the site as part of the HWRP.

NPDES Storm Water Discharge Permits

In 1992, the SWRCB adopted a General Construction Storm Water Discharge Permit, which requires land owners to file a Notice of Intent to discharge stormwater runoff to waters of the U.S., from land disturbances greater than 5 acres. The permit was reissued in 1999 and modifications made in 2001. The permit generally requires dischargers to eliminate non-stormwater discharges to

stormwater systems, develop and implement a stormwater pollution prevention plan, and perform inspections of stormwater pollution prevention measures.

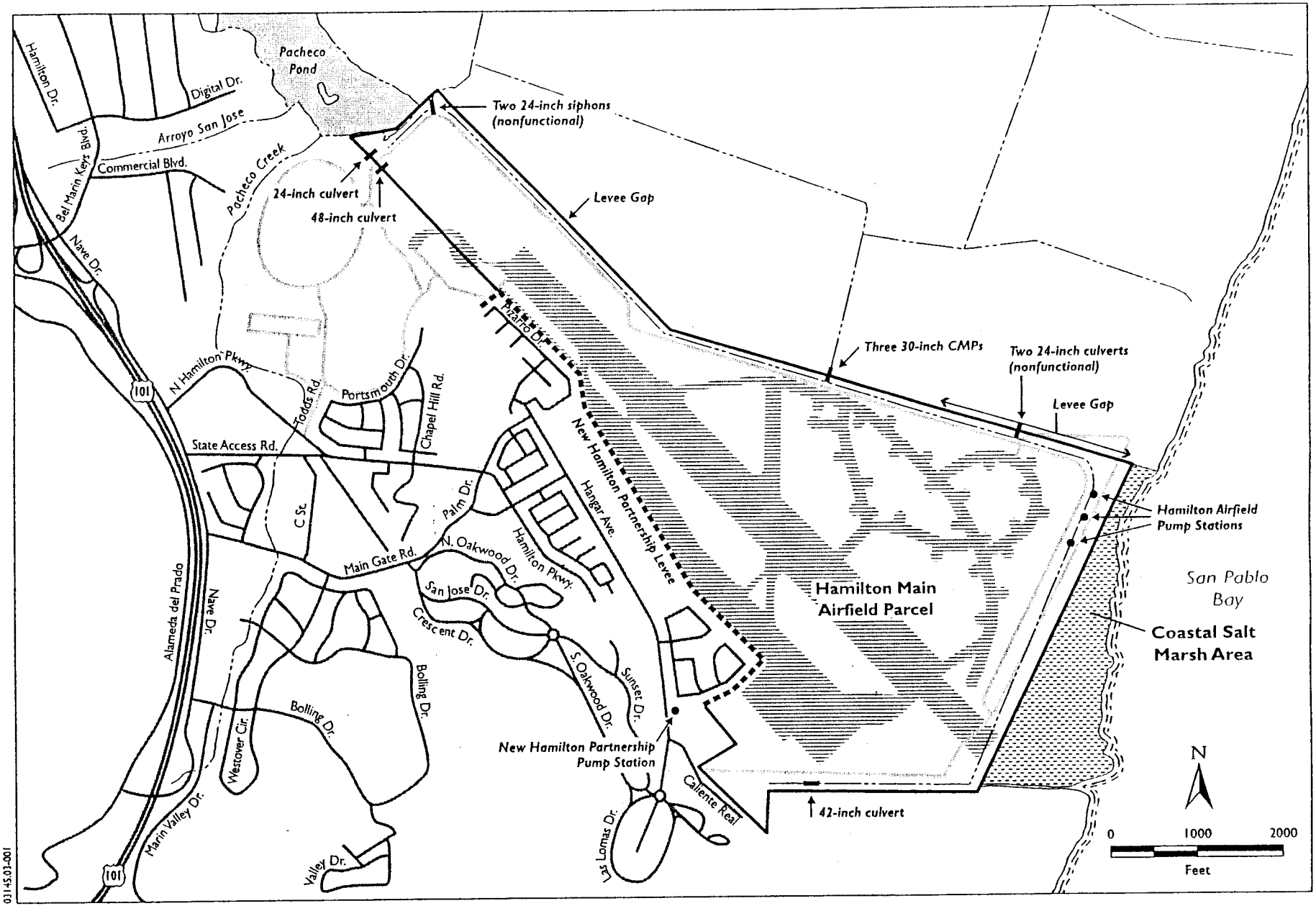
Surface-Water Drainage

Major drainage features and hydrologic resources in the project area are include Pacheco Pond, Pacheco Creek, and Arroyo San Jose (Figure 3.2-1).

Drainage from the main airfield parcel is collected in the perimeter drainage (PDD) ditch system and conveyed to pump stations on the margin of San Pablo Bay (Buildings 35, 39, and 41). In addition to the main airfield parcel, the PDD receives drainage from several adjacent areas:

- drainage flows through a 42-inch gated culvert through the perimeter levee near the southwest corner of HAAF on the St. Vincent's property, which carries flows from the western portion of the Coast Guard housing and Long Point peninsula upland areas adjacent to the airfield, and from a portion of the St. Vincent's property;
- drainage from the New Hamilton Partnership development, the eastern portion of the Coat Guard housing area, and other areas adjacent to the west side of the airfield that are conveyed to the ditch in two outfalls—one near Reservoir Hill (west outfall) and one near the southwest corner of the airfield (east outfall);
- flood overflow (under some conditions) from Pacheco Pond and the BKMV parcel through a levee gap approximately 2,000 feet southeast of the northwest corner of the HAAF parcel; and
- flood overflow (under some conditions) from Pacheco Pond and the BMKV parcel through three 30-inch culverts through the perimeter levee (located high on the slope).

The HAAF site receives flood overflows from Pacheco Creek via 48- and 24-inch flap gates that serve the Landfill 26, Ammo Hill, and POL Hill areas. However, prior to 1999, the Army completed construction of a berm around a portion of Landfill 26 to protect the landfill from overflow from Pacheco Creek up to the 100-year flood. (HAAF BRAC Environmental Office 2001.) Historically, HAAF also received overflows from Pacheco Pond via 2 slide-gated siphons. These siphons are no longer operational (Philip Williams & Associates 1998). Flood overflow and normal drainage from the SLC parcel also formerly entered the site through two 24-inch gated culverts. These culverts are also no longer operational.



Jones & Stokes

Figure 3.2-1
Regional Drainage Features

Regional Water Quality Conditions

San Pablo Bay is the receiving water for all drainage from the area. The Bay receives substantial inflow from the Sacramento and San Joaquin Rivers and smaller amounts of inflow from the Petaluma and Napa Rivers and Sonoma and Novato Creeks. Water quality is maintained by circulation and flushing as a result of tidal action and freshwater inflow. Water quality and salinity in the Bay are determined by the relative mix of these water sources.

In a natural system, surface-water quality depends primarily on the mineral composition of the rocks in the upper source areas of the stream. Farther downstream, the water quality is influenced by the mineral characteristics of the materials through which it flows and by contributions from tributaries. In an urban or developed system such as San Francisco Bay, water quality is also affected by discharges from point and nonpoint sources.

Water quality in San Pablo Bay has been evaluated as part of a study of San Francisco Bay (Aquatic Habitat Institute 1990). Data from the Aquatic Habitat Institute study indicate that levels of some pollutants may be lower than indicated by previous data. However, several pollutants are still present at levels of concern in San Pablo Bay and San Francisco Bay as a whole. The SWRCB submitted the 2002 Clean Water Act Section 303(d) impaired water body list to the U.S. EPA on February 28, 2003. Table 3.2-1 lists waters in the San Pablo Bay region that have been designated as impaired under Section 303(d) of the CWA and the pollutants for which they were so designated. The designation as impaired can be the result of pollutants, such as heavy metals or pesticides, or a physical property of the water, such as dissolved oxygen or temperature.

The water quality in the San Pablo Bay tributaries is influenced by past and present agricultural activities. Sonoma Creek and the Petaluma and Napa Rivers are impaired by sediment, nutrients, and pathogens that are all related to the abundant agricultural activities found in their watershed. The North Bay and San Pablo Bay are also impaired by persistent agricultural chemicals, such as DDT and Chlordane, which may have been used anywhere in the Sacramento and San Joaquin Rivers watersheds. These areas are also impaired by metals and PCBs from past industrial and mining activities. Water quality in the area is further impaired because of mercury, and a health advisory has been issued for the entire San Francisco Bay estuary (California Regional Water Quality Control Board, San Francisco Bay Region 1997) because of mercury levels in aquatic life.

Table 3.2-1. Waters in the San Pablo Bay and Tributary to the Bay Listed as Impaired or for Monitoring by the San Francisco Bay Regional Water Quality Control Board under Section 303(d) of the Clean Water Act

Impaired Water Body/Waterway	*Impairment Listing (Pollutant)*
Petaluma River	Diazinon
Petaluma River - tidal portion	Nickel, Copper

Monitoring Water Body/Waterway	*Pollutant Monitoring*
San Pablo Bay	Copper, Nickel, PAHs, PBDEs
Novato Creek below Stafford Dam	Sedimentation

Source: State Water Resources Control Board 2003.

Site-Specific Water Quality Conditions

The existing soil conditions are important in determining water quality at the proposed wetland restoration site. The HAAF inboard area is a former tidal salt marsh and mudflat. Soils in this area can affect water quality because of the presence of acid-sulfate soils; however, sampling of stormwater runoff by the Army indicates that the pH of water from the site is slightly basic (pH 7.2 to 7.9 compared to neutral pH of 7.0) (U.S. Army Corps of Engineers 2003).

Urban Runoff

Urban runoff from the adjacent properties is collected by a series of storm drains and a perimeter drainage ditch (PDD) around the airfield. The PDD drains to pump stations that discharge into San Pablo Bay. Urban runoff from paved areas and other impervious surfaces, as well as former activities such as aircraft and vehicle maintenance, can contain a variety of pollutants that can degrade water quality. The historic discharge of urban runoff from the former HAAF has affected the PDD, as well as the upper intertidal zone of the salt marsh near the pump station outfall. Several sites associated with site drainage are addressed in the ROD/RAP, including the PDD, spoils piles associated with periodic dredging of the PDD, the pump station locations (building 35 and 39, and the building 41 area), and the outfall drainage ditch in the outboard salt marsh. Elevated levels of metals, petroleum hydrocarbons, and pesticides have been detected in sediments associated with these features. PAHs and beryllium have been detected in the PDD. Residual contamination on the site is described in detail in Chapter 2, "Description of the Proposed Project" and Section 3.6, "Hazardous Substances and Waste."

Pacheco Pond (also referred to as Ignacio Reservoir), immediately northwest of HAAF, receives flow from Arroyo San Jose and Pacheco Creek, as well as stormwater runoff from the adjacent business park. Pacheco Creek runs through

the northwest portion of the former HAAF. Water quality concerns at Pacheco Pond have been investigated in the past but no contamination issues have been documented. Lack of aeration and circulation in Pacheco Pond, combined with stormwater runoff, may potentially be reducing dissolved oxygen, thereby causing periodic toxicity (San Francisco Regional Water Quality Control Board 2001b). Previously, during high tides, when Novato Creek backed up, excess water flowed into the pond and then through siphons in the west levee and into the airfield northern drainage ditch. However, presently these siphons are inoperable and flow from the pond is not possible. The HWRP conceptual design includes the possibility of connecting Pacheco Pond to the restored wetland area on the HAAF parcel.

Permitted Discharges

Novato Sanitation District (NSD) discharges treated wastewater through a 54-inch reinforced-concrete pipe into San Pablo Bay. The outfall line follows the northern boundary of the site, between the HAAF and SLC parcels, and discharges through a diffuser about 900 feet offshore into the intertidal zone of the Bay. Before the treated wastewater is discharged into the Bay, the NSD dechlorination plant performs final treatment of the wastewater discharge stream. Treated wastewater is discharged only during winter and spring months. During the balance of the year the treated wastewater is recycled and used for irrigation.

Groundwater

The shallow groundwater at the proposed wetland restoration site has a high salinity because of the historic influence of San Pablo Bay. Groundwater is of poor quality and is not used as a potable water source. The airfield is underlain by bay mud ranging from 30 feet to 70 feet in depth (see Section 3.1 "Geology, Soils, and Seismicity"). Due to the extent of bay mud and the lack of groundwater movement through it, there is no aquifer on the site and shallow groundwater flows the Bay via the PDD. Because of the prevalence of bay muds, runoff is unlikely to recharge the deeper groundwater under the wetland restoration site. Groundwater may be influenced by freshwater levels in Pacheco Pond and may be less saline near the pond. The general direction of groundwater flow is to the east (Woodward-Clyde 1985). However, the low transmissivity of bay muds greatly reduces the movement of shallow groundwater into San Pablo Bay. Groundwater also discharges to the interior drainage channels and is pumped to San Pablo Bay.

Contaminants have been detected in groundwater at HAAF, such as petroleum hydrocarbons (e.g., gasoline and oils) and metals. A discussion of groundwater investigations on the site is provided in Appendix B of the ROD/RAP. Based on these previous investigations, it was determined that no further action was required for groundwater in the Main Airfield Parcel or CSM area (CH2M Hill 2003).

Wetland Water Quality

Wetland water quality is influenced by water depth and morphology and the relationship of the wetland to the upstream watershed. The hydrologic regime determines the frequency, depth, and duration of the water's influence on vegetation and the aquatic functions that the wetland provides. Wetlands with little flushing and high nutrient and contaminant loading rates can become stagnant, resulting in low dissolved-oxygen content, decreased aquatic habitat quality, and adverse effects on fish and wildlife. These conditions can also promote excess algal growth and increase mosquito-breeding potential. An adequate supply of fresh water to the wetland improves the capacity for removal of nutrients and contaminants. In a salt marsh environment, adequate tidal flushing maintains good water quality by reducing the potential for development of these conditions.

Wetlands can improve the quality of source waters by decreasing water velocity, inducing sediment deposition, and removing excess nutrients and contaminants. Nutrients and contaminants can adsorb (attach themselves) to sediments in a wetland and be removed by deposition, chemical breakdown, and assimilation into plant and animal tissues.

Environmental Impacts and Mitigation Measures

Approach and Methods

Water quality effects were evaluated qualitatively based on professional judgment. Potential water quality impacts were identified by considering the concentrations of residual contaminants in soil and the remedial actions proposed in the ROD/RAP to determine if impacts to water quality could occur. The water quality analysis also relies on other sections in this chapter, especially Section 3.1 "Geology, Soils, and Seismicity" and Section 3.6 "Hazardous Substances and Waste." The evaluation of water quality effects is fundamentally based on the action goals and remedial action objectives developed in the FFS and the ROD/RAP, which rely on detailed pollutant transport and fate models developed for the Human Health and Ecological Risk Assessment (U.S. Army Corps of Engineers 2001).

Impact Mechanisms

Disturbance of contaminated soils has the potential to release contaminants into the water column through direct contact between exposed soils or contaminants flowing into water bodies in sediments or from dewatering of excavated materials. Sites proposed for excavation are in the CSM and adjacent to San Pablo Bay, or within the perimeter drainage ditch. The site is also adjacent to Pacheco Pond; however runoff from the HAAF parcel does not drain to the pond.

With implementation of the HWRP, the HAAF parcel will drain directly to San Pablo Bay and will not drain to Pacheco Pond. In addition, residual contamination is proposed to be addressed through in-situ or on-site management. Future channel scour following breach of the perimeter levee may expose these contaminants to the water column. As proposed in the ROD/RAP, morphological modeling to define the location and depth of channel scour and final HWRP design will be used determine the appropriate locations for in-situ and on-site management of contaminants. All sites at risk for potential exposure from channel scour would be excavated and disposed of off site.

Thresholds of Significance

The following significance criteria were used to evaluate the proposed project. Regarding surface hydrology, the proposed project was identified as resulting in a significant impact on the environment if it would

- violate any water quality standards or waste discharge requirements,
- substantially degrade surface water and/or groundwater quality,
- contaminate a public water supply, or
- substantially increase suspended solids in and turbidity in receiving waters.

Impacts and Mitigation Measures of the Proposed Project

Impact WQ-1: Potential Long-Term Degradation of Surface Water and Sediment Quality from Residual Contamination. As stated in the ROD/RAP, the long-term objectives of the project is to remove or isolate residual contaminants in a manner and to levels that are protective of wetland receptors. The RWQCB, as authorized by the PCWQCA, would adopt site cleanup requirements (SCRs) that will ensure implementation of the final approved ROD/RAP. Through the SCRs, the State will ensure that agreed-upon environmental assurance actions are taken to address residual concentrations of Inboard Area-Wide DDTs and PAHs in soils adjacent to the runway through the imposition of WDRs governing the implementation of the HWRP.

Sites containing residual contaminants above the action goals deemed appropriate for potential wetland receptors would be excavated and disposed of offsite. Residual contamination at certain sites would remain on the site, either under in-situ or on-site management. In addition, as stated in the ROD/RAP, residual contamination above action goals may remain on the site if excavation in the CSM becomes infeasible prior to achieving the action goals. Suspension of excavation of CSM sites prior to achieving action goals for the contaminants of concern would be based on concurrence from the State and the Army that

residual contamination would not pose a significant risk to human or ecological health.

Also, in accordance with the ROD/RAP, all sites proposed for in-situ or on-site management, or any sites where action goals cannot be achieved, would require institutional controls in the form of land use restrictions to ensure that future exposure of contaminants to human or environmental receptors does not occur. These controls would require that grading, excavation, and intrusive activities must be conducted pursuant to a State-approved plan, and that the property shall not be used for residences, schools, daycare facilities, hospitals, hospices, or other similar sensitive uses. The HWRP does not envision the use of the site for any of these sensitive uses. In addition, State and federal agencies must have access to the property to carry out response actions or other activities consistent with the purposes of the ROD/RAP. Exposure of residual contamination from channel scour is addressed under Impact WQ-2.

Removal of contaminants in the coastal salt marsh would decrease introduction of contaminants from CSM sites presently. Removal of contaminants in inboard sites and reduction of potential exposure to the environment (through management on-site or in-situ) as proposed in the ROD/RAP are designed to avoid substantial degradation of beneficial uses associated with the future wetland and San Pablo Bay. Adoption of SCRs by RWQCB is the means by which the RWQCB assures that the remediation is protective of these beneficial uses. With the implementation of the ROD/RAP, adoption of SCRs for the ROD/RAP, adoption of WDRs for the HWRP, the implementation of the ROD/RAP and the HWRP are expected to result in a less-than-significant impact related to long-term water quality and sediments.

Impact WQ-2: Potential for Long-term Degradation of Surface Water and Sediment Quality from Exposure of Contaminants by Channel Scour. Many sites of residual contamination are proposed to remain on the property through either in-situ or on-site management strategies. These contaminants would receive 3 feet of stable cover from either dredge materials placed on the site for the HWRP, or other sources of appropriate material. Future development and maturation of the proposed wetland may expose these contaminants as the wetland channels develop and, through tidal action, begin to cut into the sediments on site.

This potential impact is considered less than significant because: (1) the ROD/RAP provides that any site proposed for in-situ management will be addressed through excavation and offsite disposal if, based on the HWRP design and geomorphic and scour analyses, it is determined that the performance standard adopted in the ROD/RAP of 3 feet of stable cover, or equivalent, cannot be achieved; (2) monitoring and adaptive management will be required under the HWRP to ensure that the 3 feet of stable cover, or equivalent, is maintained at each site; and (3) institutional land use controls will be required to ensure that contaminants are not re-exposed.

Similar to in-situ management, areas of excavation for on-site management of DDT and PAH contaminated soils will be determined by the HWRP design and geomorphic and scour analyses. Where residual contamination of site soils exceeds the action goals for DDTs and/or PAHs, and it is determined that the performance criteria cannot be met, the HWRP will, with the concurrence of the State, excavate some or all of the impacted soils and manage them onsite. On-site management would also require monitoring, adaptive management, and institutional controls as part of the HWRP.

Impact WQ-3: Potential for Short-Term Degradation of Surface Water and Sediment Quality from Remediation Activities. As previously described, a number of contaminants are found in sediments/soils to be removed or soils to be relocated on the site and could be exposed to the water column through erosion or direct runoff. SCRs established by the RWQCB would ensure that the environmental actions, as described in the ROD/RAP, are taken to address residual concentrations of contaminants.

Construction actions associated with remediation of the site (e.g., excavation) would be subject to a general NPDES permit. The purpose of the general construction NPDES permit is to protect water quality by preventing discharges to the Waters of the U.S. The permit requires the preparation and implementation of a Storm Water Pollution Prevention Plan (SWPPP), as well as monitoring the effectiveness of the SWPPP.

A SWPPP was prepared in 1999 to address storm water management and sampling practices specific to the construction and remediation activities on HAAF. Remedial actions on the site conducted by the Army would be subject to the requirements of this SWPPP. Remedial activities conducted as part of the HWRP would be subject to the WDRs and/or a construction stormwater management permit (99-08-DWQ). As a condition of the permit or the WDRs, Best Management Practices (BMPs) such as the following would be required:

- sediment barriers, including straw bales or silt fences;
- soil stabilization measures, including straw mulching, hydromulching, jute netting, revegetation, chemical soil stabilizers, or preserving existing vegetation;
- runoff controls, including containment areas, runoff diversions or sediment traps; and
- construction practices, including dust control measures and covering soil stockpiles to prevent erosion.

With implementation of the measures in the SWPPP and WDRs, short-term construction effects on water quality are expected to be less than significant.

Impact WQ-4: Potential Degradation of Groundwater Quality. Shallow groundwater on the site is of poor quality and no beneficial uses have been identified by RWQCB. Because of the presence of bay muds at the site, surface water and shallow groundwater are unlikely to recharge deeper groundwater.

The continuous saturated clay and lack of movement of groundwater within the clay would result in limited movement of contaminants. No further action with regard to groundwater is proposed in the ROD/RAP. This impact is considered less than significant.

Section 3.3

Public Health

Environmental Setting

Public health issues related to the proposed project include

- public health risks from exposure to hazardous materials; and
- mosquitoes, which can create a public nuisance and transmit disease to humans.

Potential public health and safety issues related to hazardous materials are analyzed in Section 3.6, "Hazardous Substances and Waste." Mosquito breeding conditions and control measures are described in the 1998 HWRP EIR/EIS. This section describes the potential impacts on public health and safety associated with mosquitoes that may occur with implementation of the proposed project.

Environmental Impacts and Mitigation Measures

Impact Mechanisms

Impact mechanisms include the creation of mosquito breeding habitat through ponding of water in depressions created during the excavation of contaminated soils.

Thresholds of Significance

The project would be considered to have a significant impact if habitat changes would necessitate increasing mosquito abatement programs to maintain mosquito populations at preproject levels.

Impacts and Mitigation Measures of the Proposed Project

Impact PH-1: Increase of Potential Mosquito Breeding Habitat. During construction, surface water may pond in depressions created in portions of the project area as a result of excavation activities. The excavated areas would be relatively small compared to existing breeding habitat and would not be likely to result in a substantial increase in mosquito production. The excavated areas would also mostly be backfilled, which would eliminate the potential to create breeding habitat. This impact is considered *less than significant* and no mitigation is necessary.

Section 3.4

Biological Resources

Introduction and Data Sources

Biological resources evaluated for the proposed project include native and non-native aquatic and terrestrial habitats, special-status communities, and special-status plant and animal species. This section describes existing biological resources present and potential impacts on these resources that may occur with implementation of the proposed project. The habitats present at the HAAF site were described in the 1998 EIS/EIR and are summarized below. No new surveys for biological resources were conducted for this subsequent EIR. However, information presented in the 1998 document was updated with data from recent environmental documents and surveys, including

- *Final Supplemental Environmental Impact Report/Statement for Bel Marin Keys Unit V Expansion of the Hamilton Wetland Restoration Project*, prepared by Jones & Stokes for the California State Coastal Conservancy and the U.S. Army Corps of Engineers, April 2003;
- a 2003 search of the California Natural Diversity Database (DFG 2003);
- *Draft Final Environmental Baseline Survey Main BRAC Property Hamilton Airfield*, prepared by CH2M Hill for the U.S. Army Corps of Engineers, March 2002;
- *Biological Assessment for Hamilton Army Airfield BRAC Property, North Antenna Field, and Hamilton Restoration Project*, prepared by Department of Army Forces Command and others, April 2002; and
- various other survey results, including a bat survey (LSA 1997a), California clapper rail and California black rail survey (LSA 1997a), red-legged frog survey (LSA 1997b), and a burrowing owl study (LSA 1997c).

Environmental Setting

Biological Communities

Subtidal aquatic, intertidal, wetland, and grassland communities and developed areas are the habitats present in the HAAF. These habitats and the associated

plant and wildlife species are described below. The distribution of habitat types within each area is presented in Figure 3.4-1. Habitat types and acreages are derived from the results of previous habitat inventories of the project area.

Aquatic Communities

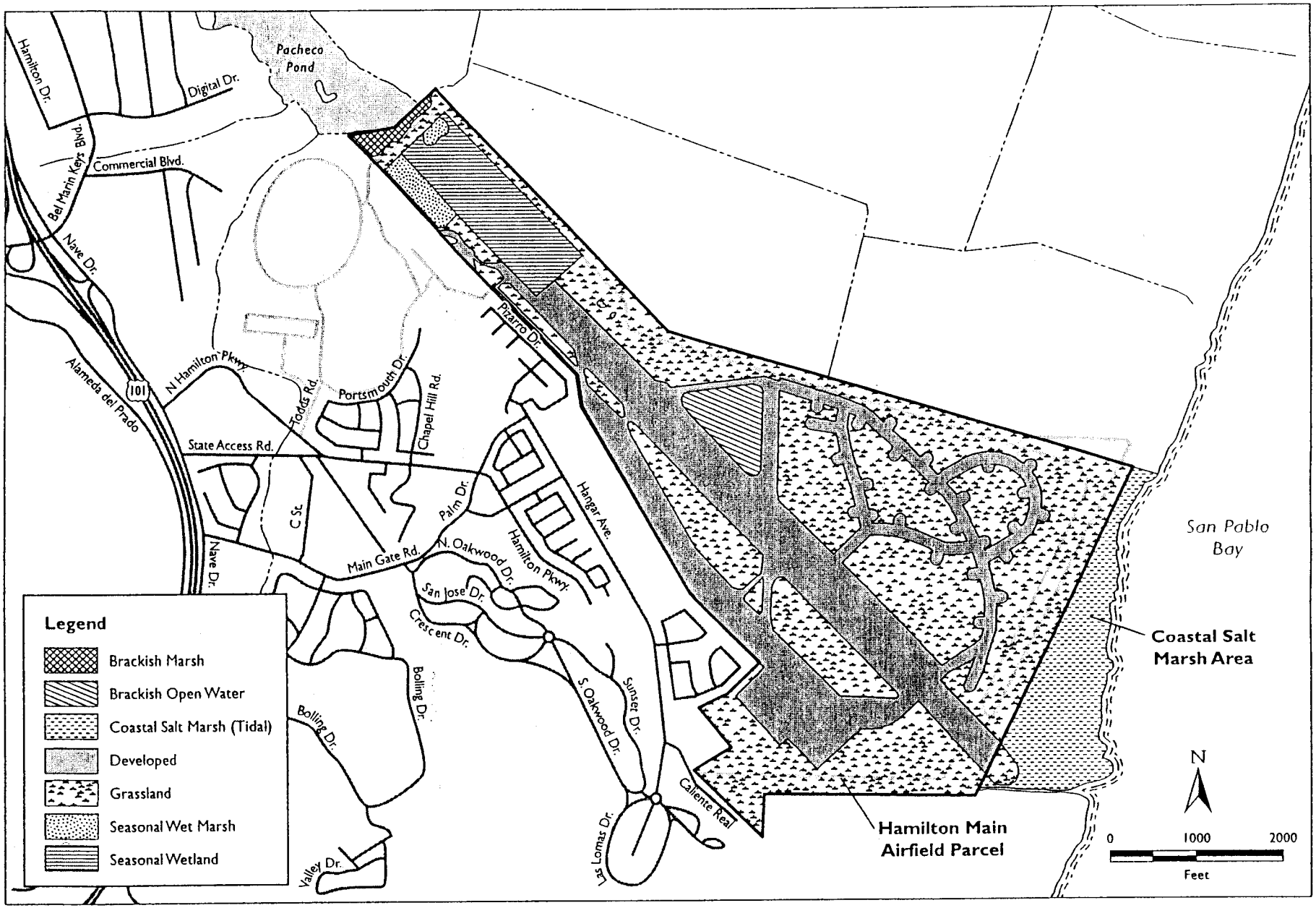
Aquatic communities include subtidal (aquatic habitats that are never exposed during low tide) and intertidal (emergent marsh habitat and mudflats that are exposed during low tides). Each of these is described below.

Subtidal Aquatic Habitat. Subtidal aquatic habitats are areas of continuous open water that are submerged during even the lowest tide. As a result, these areas are too deep to support the types of vegetation found in emergent (occasionally exposed) marsh habitat. Phytoplankton; zooplankton; and fish such as longfin smelt, northern anchovy, speckled sanddab, and staghorn sculpin occupy subtidal aquatic habitat. Benthic organisms such as worms and clams can be found in the sandy, muddy bottom. Many species of waterfowl and diving birds use subtidal aquatic habitat for feeding areas.

Intertidal Aquatic Habitat. Intertidal aquatic habitat comprises two subtypes of habitat, intertidal mudflats and coastal salt marsh.

Intertidal mudflats are composed of unconsolidated, muddy bottom areas without vegetation and are present along the bay side of coastal salt marshes that are outboard (on the bay side) of the perimeter levee. Mudflats are exposed twice daily during low tide and extend to the extreme low water elevation. Narrow bands of mudflat are also found at the same elevations along the margins of subtidal channels in tidal marshes. Mudflats are highly productive and support large populations of benthic (bottom-feeding) organisms, including aquatic worms, crustaceans, and mollusks that are important elements of the estuarine foodweb. When exposed or covered by shallow water, mudflats provide important foraging areas for migrant and wintering shorebirds, wading birds, and gulls.

Coastal salt marsh contains persistent, rooted herbaceous vegetation dominated by cordgrass and pickleweed. The vegetation in the marsh habitat is used as direct cover and sources of food by rearing juvenile and adult fish such as longfin smelt, chinook salmon, and steelhead. Because emergent marsh habitat is within the tidal zone, it drains frequently and therefore is not used for spawning. Benthic organisms use this habitat in the same way they use intertidal mudflats. Emergent marsh habitat also provides nesting, foraging, and escape cover for various songbirds and wading birds.



100-03-011

Jones & Stokes

Figure 3.4-1
Habitat Types

Wetland Communities

Five types of wetland communities are present in the project area: coastal salt marsh (tidal), coastal salt marsh (nontidal), brackish marsh, brackish open water, and seasonal wetland. All of these wetland types except brackish open water are considered jurisdictional wetlands by the U.S. Army Corps of Engineers in accordance with the federal Clean Water Act and as sensitive natural communities by the California Department of Fish and Game (DFG).

Boundaries of wetland communities in the HAAF parcel were established during a delineation of potential jurisdictional wetlands in 1991 (Jones & Stokes Associates 1991). The delineation was initially verified by the San Francisco District of the U.S. Army Corps of Engineers in 1992 and, following its expiration, was reverified (U.S. Army Corps of Engineers 1996). Since the initial delineation, a 12.4-acre jurisdictional seasonal wetland was constructed on the site as mitigation for wetlands affected by the Landfill 26 closure project.

Coastal Salt Marsh (Tidal). Coastal salt marsh under tidal influence is located between the levee at the eastern end of the project area and the open water of San Pablo Bay. This habitat can be divided into three distinct zones based on the frequency and duration of tidal inundation.

- Low marsh occupies the elevations between mean tide level and mean high water and, as such, is inundated daily. Low marsh is adjacent to the open waters of San Pablo Bay and is dominated by California cordgrass.
- Middle marsh habitat occupies the elevations between mean high water and mean higher high water and is dominated by common pickleweed. Middle marsh is predominant outboard of the perimeter levee and is inundated frequently throughout each month, although for shorter periods than low marsh.
- High transitional marsh habitat occupies the elevations between mean higher high water and the highest tide level; this habitat is inundated infrequently and for brief periods. A narrow strip along the bayside of the levee supports high marsh and supports plant species that are tolerant of saline conditions but not adapted to frequent, long-term inundation, including saltgrass, alkali heath, fat-hen saltplant, and gumplant.

The tidal salt marsh community provides food, cover, and breeding habitat for many wetland-dependent wildlife species. The dense vegetation and large invertebrate populations typically associated with salt marshes provide ideal nesting and foraging conditions for a variety of bird species, including rails, egrets, herons, waterfowl, and shorebirds. In addition to being important habitat for wetland-associated wildlife, the salt marsh community is also a crucial component of the San Pablo Bay ecosystem, providing nutrients and organic matter to the mudflats and open water of the bay. These, in turn, are important habitats for a variety of waterfowl, shorebirds, and other water birds. Wildlife species observed in and surrounding the HAAF parcel during field surveys

conducted in 1994 include double-crested cormorant, great blue heron, great egret, American coot, killdeer, northern harrier, and San Pablo song sparrow. Other species expected to use tidal salt marsh include the raccoon, mallard, sora, Virginia rail, and willet (May & Associates 2001, Jones & Stokes 2002).

Brackish Marsh. Brackish marsh occurs at the northwestern end of the HAAF parcel and along portions of the perimeter drainage ditch. Dominant emergent wetland plants along drainage ditches are alkali bulrush and cattail. Because marsh vegetation associated with ditches occurs in narrow linear bands, these habitat areas typically support a lower diversity of wildlife than do larger, more contiguous units of brackish marsh. Drainage ditch banks and channels also provide foraging habitat and cover for some species, such as herons, egrets, and dabbling ducks, and movement corridors for striped skunks, raccoons, and other species. Common species observed using the HAAF perimeter ditch include the threespine stickleback, mosquito fish, and red-winged blackbird.

Brackish Open Water Habitat. Approximately 13 acres of brackish open water habitat was created by excavation of the Landfill 26 cap borrow pit in the HAAF parcel. Water depth in the pit averages about 4 feet and pit margins support relatively little vegetation. The pit pond provides relatively low-quality wildlife habitat because water depth is marginal for the establishment of emergent vegetation, which provides cover and foraging areas for many wetland-associated species. The pit pond, however, provides suitable resting habitat for waterfowl and other water birds.

Seasonal Wetland. The HAAF parcel includes a 12.4-acre seasonal wetland created as mitigation for the Landfill 26 closure project. Per the 1998 EIS/EIR, this wetland is not considered jurisdictional by the U.S. Army Corps of Engineers. Plant species that may dominate in seasonal wetland habitat are saltgrass, alkali heath, salt marsh bulrush, fat-hen saltplant, western goldenrod, sheep sorrel, six-weeks fescue, tall fescue, sedge, rush, and creeping wildrye.

Seasonal wetlands in the HAAF parcel are considered low-quality habitat for wildlife, however, because they occur as small, scattered areas, pond water for only a short duration, and provide little cover for wildlife. Consequently, these habitat areas do not have sufficient continuous acreage to meet the breeding and foraging habitat needs of many wetland-dependent wildlife species.

Grassland Communities

Two types of grassland communities, fescue grassland and annual grassland, are present in the project area.

Annual grassland vegetation in the project site is ruderal (grows in disturbed areas) and dominated by weedy non-native annual grasses and forbs, such as ripgut brome, wild oats, Mediterranean barley, perennial ryegrass, yellow star-thistle, curly dock, bristly ox-tongue, and black mustard.

Fescue grassland is found mostly in low areas around the southeastern and northwestern margins of the airfield in the HAAF parcel. Vegetation in the fescue grassland is dominated by tall fescue, a non-native, perennial bunchgrass, in association with annual grassland species. Scattered shrubs and non-native trees are also present in some grassland areas.

Common wildlife species that may utilize grassland habitat on-site include the gopher snake, western fence lizard, turkey vulture, red-tailed hawk, American kestrel, California quail, ring-necked pheasant, savannah sparrow, western meadowlark, Brewer's blackbird, California vole, black-tailed hare, desert cottontail, California ground squirrel, black-tailed deer, coyote, striped skunk, and raccoon.

Developed Areas

Developed areas on-site include hangars, buildings, drainage pump stations, utility infrastructure, antenna installations, aboveground fuel tanks and fuel lines, and paved runway and revetment areas. Developed areas support a low diversity of wildlife compared to vegetated habitats. Species commonly associated with developed areas include the barn swallow, northern mockingbird, American crow, and European starling.

Special-Status Species

Special-status species are plants and animals that are legally protected under the state and federal Endangered Species Acts or other regulations, and species that are considered sufficiently rare by the scientific community to qualify for such listing. Special-status plants and animals are species in the following categories:

- species listed or proposed for listing as threatened or endangered under the federal Endangered Species Act (50 CFR 17.12 [listed plants], 50 CFR 17.11 [listed animals], and various notices in the Federal Register [proposed species]);
- species that are candidates for possible future listing as threatened or endangered under the federal Endangered Species Act (61 FR 7596-7613, February 28, 1996);
- species listed or candidates for listing by the State of California as threatened or endangered under the state Endangered Species Act (14 California Code of Regulations 670.5);
- species that meet the definitions of rare, threatened or endangered under CEQA (State CEQA Guidelines, Section 15380);
- plants listed as rare or endangered under the California Native Plant Protection Act (California Fish and Game Code, Section 1900 et seq.);

- plants considered by the California Native Plant Society to be rare, threatened, or endangered in California (Lists 1B and 2 in Skinner and Pavlik 1994);
- plants listed by the California Native Plant Society as plants about which more information is needed to determine their status and plants of limited distribution (Lists 3 and 4 in Skinner and Pavlik 1994), which may be included as special-status species on the basis of local significance or recent biological information;
- animal species of special concern to DFG (Remsen 1978 [birds], Williams 1986 [mammals], Jennings and Hayes 1994 [amphibians and reptiles], and Moyle et al. 1995 [fish]); and
- animals fully protected in California (California Fish and Game Code, Section 3511 [birds], 4700 [mammals], and 5050 [reptiles and amphibians]).

A detailed listing of special-status plant and animal species that occur or have potential to occur in or near the project site and their likely status in these areas is presented in Appendix D.

Plants

Fourteen special-status plant species have potential to occur in or near the project area; however, they are not known to be present on-site (see Table D-1 in Appendix D). Potentially suitable habitat is present for only three of those species: soft bird's-beak, Point Reyes bird's-beak, and Marin knotweed (Environmental Science Associates 1993). Potential habitat for these species is associated with the transitional zone at the upper margins of coastal salt marshes. These species were not found during rare-plant surveys conducted in the HAAF parcel in 1993 (Environmental Science Associates 1993). This potential habitat is associated with the transitional zone at the upper margins of the coastal salt marsh area.

Wildlife

Five special-status fish and 14 special-status wildlife species are known to occur or are assumed to use suitable habitat within diked portions of the project sites or in marshes and aquatic habitats bayside of the perimeter levees, including

- longfin smelt,
- Central Valley steelhead,
- chinook salmon,
- coho salmon,
- Sacramento splittail,
- double-crested cormorant,

- California brown pelican,
- California clapper rail,
- California black rail,
- northern harrier,
- burrowing owl,
- saltmarsh common yellowthroat,
- San Pablo song sparrow,
- salt marsh harvest mouse,
- white-tailed kite,
- golden eagle,
- peregrine falcon,
- short-eared owl, and
- pallid bat.

The state and federal status, habitats, distribution in California, and occurrence (or potential to occur) are presented in Table D-2 in Appendix D. This list was derived from the sources noted at the beginning of this section as well as the result of several recent surveys which are summarized below:

- **California Clapper Rail Surveys: HAAF and Antenna Field** (LSA 1998). LSA Associates conducted studies in 1998 to determine the presence or absence of clapper rails in the HAAF and Antenna Field properties during the breeding season for the species, and to map approximate location used by individuals and pairs. Surveys were conducted during March and April 1998, during which time both clapper rails and black rails were consistently observed on the HAAF site. The rails were observed primarily in areas where the tidal marsh habitat is widest.
- **California Red-Legged Frog Survey: Hamilton Army Airfield** (LSA 1997b). LSA Associates conducted studies in 1997 to determine the presence or absence of the California red-legged frog on the HAAF site and vicinity. While the HAAF airfield parcel contains several areas of potentially suitable habitat for the species, no red-legged frogs were observed in these areas or in adjacent suitable habitat areas surveyed.
- **Burrowing Owl Survey and Relocation** (LSA 1997c). Surveys of HAAF by LSA in 1997 found burrowing owls on the site. These owls were relocated in accordance with DFG protocols, prior to previous site activity. However, owls may have recolonized the HAAF airfield parcel subsequent to the relocation and are considered potentially present on the site.
- **Bat Survey** (LSA 1997a). LSA Associates performed surveys for bats at five HAAF buildings (B-831, B832/836, B833, B510, and B521) identified for demolition. The search focused on two special-status species, the pallid bat (*Antrozous pallidus pacificus*) and Townsend's big-eared bat

(*Corynorhinus townsendii pallescens*). Both are California special concern species. Surveys were conducted visually for bats and bat sign between 4:00 PM and 10:00 PM on March 25, 1997. An ultrasonic sound detector was also used to detect bat vocalizations. Other common bats were observed, including *Myotis* sp. and big brown bats (*Eptesicus fuscus*), but the buildings were considered unlikely habitat for the special concern species.

No adverse effects on the other special-status species other than those noted above are expected because either (1) they are not likely to occur in the project area due to lack of suitable habitat, (2) there are no known occurrences near the project area, and/or (3) surveys for certain species determined they were not found in the project area. A more detailed description of the species considered during this assessment and their habitat requirements is presented in Appendix D.

Environmental Impacts and Mitigation Measures

Thresholds of Significance

The project is considered to have a significant impact on biological resources if it would

- decrease the acreage or quality of intertidal and subtidal aquatic habitats,
- decrease the acreage or quality of tidal or nontidal wetlands,
- substantially decrease the acreage or quality of waterfowl breeding or wintering habitat,
- substantially decrease the acreage or quality of migrant and wintering shorebird habitat, or
- result in the permanent loss of occupied special-status species habitat or result in the direct mortality of individual special-status species.

Impacts and Mitigation Measures of the Proposed Project

Impact BIO-1: Loss of Tidal Coastal Salt Marsh. Remediation activities may result in the temporary loss of approximately 6 acres and the permanent loss of approximately 0.3 acre of high, middle, and low tidal coastal salt marsh. The ROD/RAP would be implemented to facilitate implementation of the HWRP, which would in turn create an estimated 485 acres of coastal salt marsh on the HAAF parcel. Thus the loss of coastal salt marsh under the ROD/RAP would be indirectly offset by restoration of habitat under the HWRP. Nevertheless, loss of coastal salt marsh under the ROD/RAP is considered a significant impact. To reduce this impact to a less-than-significant level, the following Mitigation Measure BIO-1 will be implemented.

Mitigation Measure BIO-1: Monitor Site Development and Implement Actions to Increase the Rate of Marsh Development if Required. In accordance with the ROD/RAP, all areas of coastal salt marsh disturbance, except those in the area of the proposed channel cut, will be backfilled with suitable on-site or rehandled dredge materials and recontoured to promote reestablishment of native vegetation. Disturbed areas in the coastal salt marsh are expected to naturally revegetate. To ensure these sites are successfully re-colonized, a mitigation monitoring plan for the coastal salt marsh will be developed and implemented. Restored coastal salt marsh will be monitored annually for 5 years. The monitoring program will be designed to determine if coastal tidal marsh is developing and its primary supporting physical processes are occurring (i.e., tidal exchange and sedimentation). Adaptive management measures, if determined necessary by monitoring, may include additional backfill, seeding or manual revegetation, or other measures necessary to promote development of the marsh.

Impact BIO-2: Temporary Disturbance to Special-Status Birds Occupying Coastal Salt Marsh Habitat. Noise, vibration, visual, and proximity-related disturbances associated with proposed remediation could adversely affect the northern harrier, California black rail, California clapper rail, saltmarsh common yellowthroat, and San Pablo song sparrow during the breeding season. If individuals of these species nest in the project area while remediation activities are being conducted, construction disturbances could cause individuals to abandon their nests or young; the breeding success of these species could be reduced if disturbances reduce the ability of adults to properly care for their eggs or young. Nests with eggs or young birds could also be crushed by remediation activities in the outboard tidal marsh, or young birds could be crushed by construction equipment or inundated or toppled by tidal flow.

This impact is considered significant because project activities could result in the disturbance and possible mortality of special-status species. This impact will be reduced to a less-than-significant level through project-wide minimization and avoidance measures described in the ROD/RAP. Construction activities will be avoided during the clapper rail breeding period (February 1 through August 31); this season also encompasses the breeding season of other special-status birds that may be present in the coastal salt marsh. If construction activities cannot be avoided during the clapper rail breeding period, Mitigation Measure BIO-2 will be implemented.

Mitigation Measure BIO-2: Conduct Preconstruction Surveys to Locate Northern Harrier, California Black Rail, California Clapper Rail, Saltmarsh Common Yellowthroat, and San Pablo Song Sparrow Nest Sites before Remediation Activities Are Initiated. Preconstruction surveys, as proposed in the ROD/RAP, will be conducted in the spring of each construction year to locate northern harrier, California black rail, California clapper rail, saltmarsh common yellowthroat, and San Pablo song sparrow nest sites in suitable breeding habitats. Surveys will be conducted

by a qualified biologist using survey methods approved by DFG and the U.S. Fish and Wildlife Service (USFWS). Survey results will be submitted to DFG and USFWS before construction is initiated. If nests or young are not located within 250 feet of the limits of construction, construction may proceed. If nest sites or young are located, a buffer around active nest sites will be established or construction activities will be sequenced to avoid potential impacts on the species during the breeding season. DFG and/or USFWS will be consulted to identify any further mitigation measures necessary to avoid disturbance or potential mortality of special-status species.

Impact BIO-3: Potential for Direct Mortality of Salt Marsh Harvest Mice during Remediation-Related Ground Disturbance. Excavation and backfill being placed in coastal salt marsh habitat could result in the direct mortality of salt marsh harvest mouse, a federally listed and state-listed endangered species. Project-wide minimization and avoidance measures described in the ROD/RAP, which include installation of barrier exclusion fencing to impede salt marsh harvest mice from entering construction areas, would be implemented. This impact is considered a significant impact to the salt marsh harvest mice. To reduce potential for mortality, Mitigation Measure BIO-3 will be implemented.

Mitigation Measure BIO-3: Remove Salt-Marsh Harvest Mouse Habitat and Install Barrier Fencing. The potential for construction-related mortality of salt marsh harvest mice could be reduced or eliminated by hand-removal of pickleweed and subsequent placement of a barrier fence 20 feet from the boundaries of construction areas in and adjacent to coastal salt marsh habitat. As the salt marsh harvest mouse is a fully protected and listed state species and a listed federal species, USFWS and DFG will be consulted to evaluate these and any other appropriate methods for avoiding construction-related mortality of salt marsh harvest mouse.

Impact BIO-4: Temporary Disturbance to Special-Status Birds That Occupy Brackish Marsh Habitat. Noise, vibration, visual, and proximity-related disturbances associated with proposed remediation could adversely affect special-status wildlife that nest in brackish marsh habitat. Species such as California black rail, short-eared owl, osprey, northern harrier, and saltmarsh common yellowthroat will nest in this habitat type. If individuals of these species nest in the project area while remediation activities are being conducted, construction disturbances could cause individuals of these species to abandon their nests or young; the breeding success of these species could be reduced if disturbances reduce the ability of adults to properly care for their eggs or young. Operation of construction equipment in or immediately adjacent to marsh vegetation and discharge of construction-generated sediments into the marsh could also result in the loss or degradation of the habitat.

This potential loss is considered a significant impact. To reduce this impact to a less-than-significant level, Mitigation Measure BIO-4 will be implemented.

Mitigation Measure BIO-4: Conduct Preconstruction Surveys to Locate California Black Rail, Short-Eared Owl, Osprey, Northern Harrier, and Saltmarsh Common Yellowthroat Nest Sites before Remediation Activities Are Initiated. Preconstruction surveys to locate California black rail, short-eared owl, osprey, northern harrier, and saltmarsh common yellowthroat nest sites in suitable breeding habitats will be conducted in the spring of each construction year. Surveys will be conducted by a qualified biologist using survey methods approved by DFG and USFWS. Survey results will be submitted to DFG and USFWS before construction is initiated. If nests or young are not located within 250 feet of the limits of construction, construction may proceed. If nest sites or young are located, a buffer around active nest sites will be established or construction activities will be sequenced to avoid potential impacts on the species during the breeding season. DFG and/or USFWS will be consulted to identify any further mitigation measures necessary to avoid disturbance or potential mortality of special-status species.

Impact BIO-5: Potential for Mortality of Burrowing Owls. Operating equipment in grasslands west of the perimeter levee and introducing tidal flow could result in direct mortality of burrowing owls. Occupied nesting burrows could be crushed or buried by construction equipment or inundated as a result of tidal flow. This impact is considered significant because it could result in the direct mortality of individuals of this special-status species. To reduce this impact to a less-than-significant level, Mitigation Measure BIO-5 will be implemented.

Mitigation Measure BIO-5: Conduct Preconstruction Surveys for Nesting and Wintering Western Burrowing Owls and Implement Measures To Avoid or Minimize Adverse Effects if Owls Are Present. Preconstruction surveys for western burrowing owls will be conducted by a qualified ornithologist before any development within the habitat identified as suitable for nesting or wintering burrowing owls. These surveys, which will include any potentially suitable habitat within 250 feet of construction areas, will be conducted no more than 30 days before the start of remediation, regardless of the time of year in which the activity occurs.

If breeding owls are located on or immediately adjacent to the site, a construction-free buffer zone (typically 250 feet) around the active burrow must be established as determined by the ornithologist in consultation with DFG. No activities, including grading or other construction work or relocation of owls, would proceed that may disturb breeding owls.

If owls are resident within 250 feet of the project area during the nonbreeding season a qualified ornithologist, in consultation with DFG, will passively relocate (evict) the owls to avoid the loss of any individuals if the owls are close enough to areas affected by the proposed alternatives that they or their burrows could potentially be harmed by associated activities.

Impact BIO-6: Disturbance of Roosting and Foraging Habitat for Special-Status Bat Species. Special-status bat species may roost and forage in and around abandoned structures within the project area. Construction activities at or near these locations would include disturbance from noise and human presence. This temporary disturbance to potential special-status bat species is considered significant; however, implementation of Mitigation Measure BIO-6 would reduce this impact to less than significant.

> **Mitigation Measure BIO-6: Conduct Preconstruction Bat Survey in Suitable Habitat.** A qualified biologist will conduct a preconstruction survey to determine occupancy by roosting special-status bats. If it is determined that bats are roosting in the project area, then appropriate modifications to construction time and method will be implemented. Modifications may include timing construction activities to avoid breeding periods, establishment of buffers, or biological monitoring. In some cases bats may be actively encouraged to avoid roosting in the area affected by the remediation before the onset of construction activities.

Impact BIO-7: Temporary Disturbance of Fish in San Pablo Bay during Construction. Proposed and listed fish potentially use tidal channels found within the borders of the coastal salt marsh adjacent to Hamilton. Potentially adverse direct effects to fish could include a take through direct physical contact with machinery, exposure to hazardous chemicals, and changes in physical and chemical conditions (e.g., dissolved oxygen, salinity, etc.). In accordance with the ROD/RAP project-wide minimization and avoidance measures, fish barriers would be placed at waterways that are connected to excavation sites. Implementation of this minimization and avoidance measure will reduce the described effects to a less-than-significant level.

Section 3.5

Land Use and Public Utilities

Environmental Setting

Regulatory Setting

Novato General Plan

The Novato General Plan is a comprehensive, long-range planning document that identifies the city's land use, transportation, environmental, economic, fiscal, and social goals and policies as they relate to the conservation and development of land in Novato. The general plan was adopted in March 1996.

The general plan designates the Hamilton main airfield parcel and coastal salt marsh areas as open space and defines the uses, such as natural resource preservation, outdoor recreation, floodways and flood control, and the maintenance of public health and safety, that are consistent with the planned wetland restoration.

Marin Countywide Plan

The Marin Countywide Plan is a long-range comprehensive plan that governs growth and development in the unincorporated areas of the county. The Marin Countywide Plan designates the adjacent land use on the adjacent BMKV parcel as agriculture and conservation with a permitted residential use of 1 unit per 2-10 acres.

Bay Trail Plan

The Association of Bay Area Governments (ABAG) developed the Bay Trail Plan (Association of Bay Area Governments 1989) as a framework for the implementation of the Bay Trail project. The Bay Trail is a planned recreation corridor that will provide approximately 400 miles (640 kilometers) of biking and hiking trails around the Bay and its surrounding lands when it is complete.

The City of Novato general plan includes the following program policy regarding the Bay Trail:

> Work with the Marin County Open Space District and ABAG to implement the trail system described in the Marin Countywide Plan and the Bay Trail Plan (City of Novato 1996).

The Bay Trail previously proposed a trail alignment along the levee north of the main airfield parcel but this alignment was precluded by the HWRP. Alternative alignments were evaluated in Hamilton Public Access Bay Trail Plan (Conservancy and City of Novato 2001). This study developed a preferred trail alignment that follows the eastern edge of the main airfield parcel, extends along the levee between the main airfield parcel and Pacheco Pond, and continues northwest along the edge of Pacheco Pond (Figure 3.5-1). This alignment was adopted by the City Council as an amendment to the City of Novato General Plan on June 11, 2002.

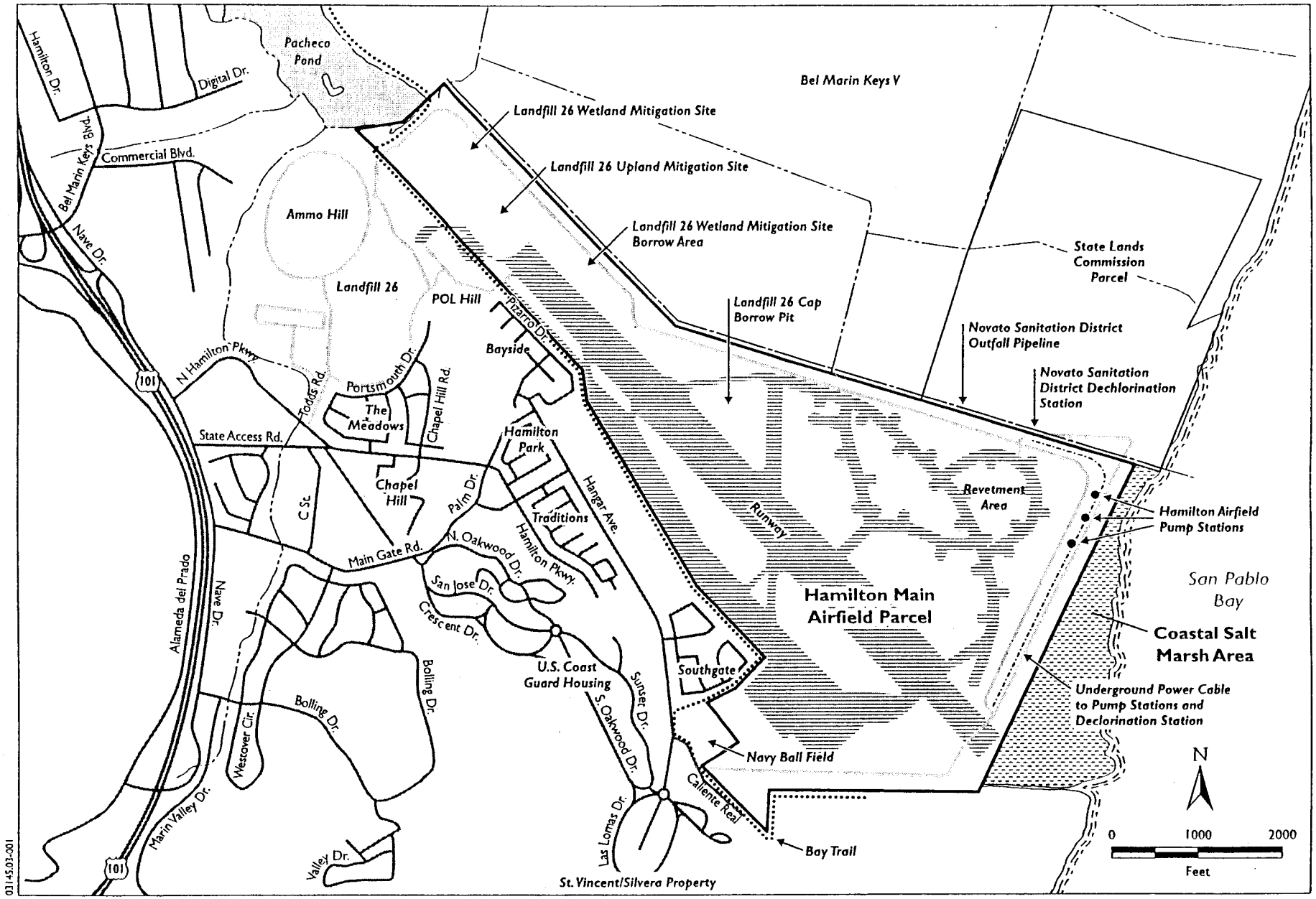
San Francisco Bay Plan

BCDC's San Francisco Bay Plan was prepared to guide the future protection and use of San Francisco Bay and its shoreline. The San Francisco Bay Plan identifies the Inboard Site and coastal salt marsh area as high-priority areas for wildlife use. The plan was amended (Bay Plan Amendment No. 1-95) to change the airport priority use designation and policy note for the former Hamilton main airfield parcel. The plan contains the following policy:

> Develop comprehensive wetlands habitat plan and long-term management program for restoring and enhancing wetlands habitat in diked former tidal wetlands. Dredged materials should be used whenever feasible and environmentally acceptable to facilitate wetlands restoration.

Land Uses, Utilities, and Easements at the Project Site

Existing land uses, utilities, and easements at the project site are described below and identified in Figure 3.5-1.



Jones & Stokes

Figure 3.5-1
Land Uses and Utilities in the Project Area

Hamilton Main Airfield Parcel

Land Uses. The Hamilton main airfield parcel includes a runway (approximately 8,000 feet long) that is no longer used, aprons, taxiways, the revetment area (airplane parking pads), and other miscellaneous structures. The revetment area is located in the northeastern corner of the Hamilton main airfield parcel and is transected by concrete-paved taxiways that connect 28 circular revetment turnouts.

Three features associated with Landfill 26 are within the Hamilton main airfield parcel: a wetland mitigation site, a borrow area, and a borrow pit. The 12.4-acre wetland mitigation site is located on the runway at the northwest end of the parcel and was constructed to replace seasonal wetlands lost during capping of Landfill 26. The borrow area is southeast of the wetland mitigation site and was excavated to provide fill for the site. The 13-acre borrow pit is also southeast of the wetland mitigation site and is a deep, triangular excavation from which material was taken to cap Landfill 26.

Utilities. A drainage ditch runs along most of the perimeter levees except for the levee that separates the New Hamilton Partnership property from the Hamilton main airfield parcel. Subdrainage pipes were installed at the Hamilton main airfield parcel to assist in lowering the water table, and those pipes discharge to the perimeter drainage ditch.

Two pump stations operated by the Army are located near the northeastern corner of the Hamilton main airfield parcel and discharge drainage from the perimeter ditch to the outboard tidal marsh. The third pump station in the same area was demolished and removed in 2001. The pump stations include pumps, piping, and associated equipment. Pipes from adjacent properties also lead into the perimeter drainage system. Additional information regarding drainage facilities at the project site is provided in the "Water Resources" section of this chapter.

Pacific Gas and Electric Company (PG&E) provides electrical power to the Hamilton main airfield parcel by means of a 60-kilovolt line from PG&E's substation and a small substation located west of the main airfield parcel on the former HAAF property. Power for the NSD dechlorination plant is provided by this system. An underground power line runs from a transformer at the HAAF pump stations along the inboard side of the levee to NSD's dechlorination plant in the SLC parcel. The dechlorination plant is planned to be relocated further to the west to avoid incompatibilities between the facility and the planned wetland restoration.

Easements and Requirements. The Army has identified three easements on the Hamilton main airfield parcel:

- Under Public Law 102-396, the New Hamilton Partnership holds an easement across the western edge of the Hamilton main airfield parcel to maintain the flood control levee that separates the Hamilton main airfield parcel from the New Hamilton Partnership development.

- The SLC has an access easement across the Hamilton main airfield parcel to maintain access to the SLC parcel. Although no official map of the easement exists, it is described as a 40-foot easement that extends from the entrance to the former Hamilton Air Force Base on Nave Drive to the SLC parcel. The easement follows existing roads.
- The NSD has an existing right of entry across HAAF to the dechlorination plant and associated facilities in the SLC parcel.

As described earlier, the Army has created a wetland mitigation site at the northern end of the airfield as compensation for the loss of wetlands that resulted during the capping of Landfill 26. The Army has indicated that the continued operation and maintenance of the wetland mitigation site would be a requirement of property transfer.

State Lands Commission

The SLC owns approximately 78 acres of property east of the main levee and adjacent to San Pablo Bay where remedial actions are proposed as part of the ROD/RAP. This area is coastal salt marsh containing mostly pickleweed and includes three perched ponds, outfall ditches associated with the FSTP and PDD, an abandoned portion the offshore fuel supply line, and a historic sewage outfall pipeline. The HWRP hydraulic off-loader pipeline also crosses this area to access the main airfield parcel.

Land Uses Adjacent or Near the Project Site

State Lands Commission Parcel

The SLC parcel (also known as the North Antenna Field) is located immediately north of the main airfield parcel and coastal salt marsh area (Figure 3.5-1). The area that now makes up the SLC parcel was owned by the Air Force and was operated as part of HAAF until 1974. While the base was active, the parcel supported a variety of uses, including a rifle range, a pistol range, and antenna facilities. It was also used at various times for skeet shooting and firefighter training. Some infrastructure related to military uses remains onsite. When HAAF was decommissioned, the State of California acquired the parcel and leased a portion of the rifle range to the City of Novato for police small-arms training (California State Coastal Conservancy and U.S. Army Corps of Engineers 1998). Antennas and associated cables are also located in the area. Other facilities at the site include aboveground fuel tanks, transformers, target-practice ranges previously used by the Novato Police Department, and burn pits.

The City of Novato General Plan designates the SLC parcel as open space. It describes open space uses as "publicly-owned land that is largely unimproved

and devoted to the preservation of natural resources, outdoor recreation, floodways and flood control, and the maintenance of public health and safety." The allowable uses within this land use category include uses devoted to the preservation of natural resources.

Bel Marin Keys Unit V Parcel

The BMKV parcel is a 1,610-acre parcel immediately north of the main airfield parcel that has been diked and used for agriculture (Figure 3.5-1). The BMKV parcel is currently being considered for restoration of wetland habitat as part of the HWRP.

Bel Marin Keys Residential Community

The marina residential area of Bel Marin Keys (BMK) is located north of the project area and includes approximately 700 single-family homes located along two managed lagoons connected to Novato Creek by two locks. The lagoons provide opportunities for recreational water sports and berthing for private watercraft. The south lagoon is contained by a levee located on property now owned by the Conservancy. Part of the south lagoon channel and the lock structure is also on lands owned by the Conservancy.

Pacheco Pond

Pacheco Pond is immediately northwest of the Hamilton main airfield parcel (Figure 3.5-1). This 120-acre site is a flood control reservoir that was constructed by the developer of the Ignacio Business Park and was deeded to Marin County Flood Control and Water Conservation District (MCFCWCD) as a detention basin for flows from Pacheco Creek and Arroyo San Jose. Water from Pacheco Pond is currently discharged to Novato Creek. The Ignacio Business Park, which is a mixed-use office/light industrial/commercial development, is located west of Pacheco Pond.

City of Novato (Ammo Hill)

Ammo Hill, located at the northwest corner of the main airfield parcel and adjacent to Pacheco Pond, is the site of a number of former Army munitions bunkers. The Ammo Hill area was transferred to the City of Novato as part of the Army/GSA Sale Parcel.

Landfill 26

Landfill 26, located west of the northern end of the main airfield parcel, is a former military landfill used for refuse disposal from the 1940s to the 1970s. Although there are no records of disposal at the landfill, the landfill reportedly received approximately 150,000 cubic yards of primarily solid wastes, including

both hazardous and non-hazardous substances, and approximately 26,000 cubic yards of oily sludge. Chemical contaminants identified in soil borings consist of volatile and semi-volatile organics, petroleum hydrocarbons, pesticides, PCBs, and metals. (RWQCB 2001)

Between 1994 and 1995, a Resource Conservation and Recovery Act (RCRA)-type landfill cap was installed. Groundwater has been monitored at the landfill since 1993 in accordance with RWQCB waste discharge requirements. Concentrations and groundwater elevation trends are well established for the landfill. Contaminant concentrations in groundwater have not varied significantly since 1993. Previous investigations concluded that Landfill 26 had an impact on groundwater and possibly surface water and sediment, but that these impacts were not found outside the Landfill 26 boundary. In 1993, a groundwater treatment system for Landfill 26 was constructed in a low-lying area that was partially paved. This building currently is not in operation. Methane venting has also been undertaken at Landfill 26. (U.S. Army Corps of Engineers 2001).

POL Hill

The POL Hill parcel is a former tank farm located west of the main airfield parcel, immediately south of Landfill 26. The POL parcel formerly contained 20 25,000-gallon underground storage tanks for jet fuel, an 840,000-gallon aboveground bulk fuel storage tank, one 25,000-gallon aboveground tank for jet fuel, and several other smaller tanks, as well as associated fuel lines and pumping systems. The tanks were removed from the site in 1986 and 1990, and remedial actions were conducted in 1990 and 1992 to address soil contamination. (U.S. Army Corps of Engineers 1996)

City of Novato (New Hamilton Partnership)

Property located southwest of the Hamilton main airfield parcel is being developed by the New Hamilton Partnership as a mixed-use area of commercial, retail, and residential uses (Figure 3.5-1). The first phase of the project was completed in 2000. The New Hamilton Partnership constructed a 100-year flood control levee in the Hamilton main airfield parcel (between the New Hamilton Partnership development and the Hamilton main airfield parcel). The Bayside residential development is located along Pizarro Drive, north of the HAAF hangars and adjacent to the main airfield parcel. Immediately southeast of Bayside, along the main airfield parcel, are the former HAAF hangars, which are currently being refurbished for commercial use, and a U.S. Coast Guard operational support area. U.S. Coast Guard housing and the South Gate residential development are located southeast of the hangar area, adjacent to the airfield. The Lanham Village, Hamilton Park, Traditions, Meadows, and Chapel Hill residential developments are located further west of the main airfield parcel

on the former HAAF property. Palmisano Park, located near the southern end of Hangar Avenue, is a childrens park operated by the City of Novato.

Navy Ballfields

The Navy ballfields parcel is a 20-acre site owned by the U.S. Navy and located in the southwest corner of the HAAF parcel. The site is a former baseball field but is currently not in use. This parcel is part of the initial HWRP project area but is not considered as part of the ROD/RAP project area because it is under the Navy's jurisdiction. Spoils Pile N on the Navy ballfields parcel is considered in the ROD/RAP.

St. Vincent's Landholdings/Las Gallinas Sanitary District

The Roman Catholic Archdiocese owns approximately 1,500 acres south and southwest of the Hamilton main airfield parcel (Figure 3.5-1). The area, known as the St. Vincent's property, is mostly undeveloped land used primarily for grazing and hay production. The Las Gallinas Sanitary District owns a parcel southeast of the Hamilton main airfield parcel and adjacent to the St. Vincent's property.

Environmental Impacts and Mitigation Measures

Approach and Methods

Information related to land uses, utilities, and easements at the expansion site was reviewed and compared to the restoration alternatives to evaluate the potential for land use conflicts, disruption or loss of services provided by utilities, or conflicts with easements. Potential impacts were compared to the thresholds of significance described below to determine the level of significance of each impact.

Thresholds of Significance

According to Appendix G of the State CEQA Guidelines and professional criteria and judgment, a project is considered to have a significant impact on land use and public utilities if it would:

- conflict or be incompatible with the land use goals, objectives, or guidelines of appropriate plans;
- substantially conflict with an existing onsite land use or with existing or future adjacent land uses; or

- result in the loss of an existing easement or service to existing facilities.

Impacts and Mitigation Measures of the Proposed Project

Impact LAND-1: Consistency with Appropriate Plans for the Project Site. The proposed project would have no direct impact on land use designations of the site in the Novato General Plan, Hamilton Reuse Plan, and the San Francisco Bay Plan or with the Bay Trail Alignment Plan. Indirectly, the proposed project would have a beneficial impact on consistency with these plans by ensuring that contamination is remediated in a manner and to levels appropriate for the overall wetland restoration planned for the site; an ultimate use that is consistent with the land use designation of the site in each of these plans. This is considered a less-than-significant impact.

Impact LAND-2: Potential Impact to Existing Utilities. Remedial activities conducted as part of the ROD/RAP may occur within or adjacent to existing utilities. In particular, the power line to the NSD dechlorination plant would be adjacent to areas proposed for excavation. Avoidance of any structural components will be addressed through the utility clearance prior to commencement of remedial activities. This is considered a less-than-significant impact.

Impact LAND-3: Potential Impact to Existing Easements. Remediation activities, primarily along the eastern levee, may interfere with easements held by SLC to access the North Antenna Field Parcel and NSD to access the dechlorination plant. Through scheduling or provision of alternate routes across the site, it is anticipated that these easements could be reasonably accommodated during the planned site remediation. Following breach of the levee, an alternate access to the SLC parcel and NSD plant would have to be developed. Prior to levee breach and as part of the HWRP, the north levee between the HAAF and BMKV parcels would be reconstructed to support continued access to the NSD outfall line. It is anticipated that access to the SLC parcel could also be provided via this route. The planned relocation of the NSD dechlorination plant would preclude the need for an easement across the airfield in the long term. This is considered a less-than-significant impact.

Impact LAND-4: Compatibility with Adjacent Land Uses. Remedial activities conducted as part of the ROD/RAP would not result in any direct impact to current or future adjacent land uses. The proposed project would have indirect beneficial impacts on adjacent land use consistency by enabling future wetland restoration on the site for wetlands, which would be a use consistent with the current and planned uses of adjacent lands. This is considered a less-than-significant impact.

Section 3.6

Hazardous Substances and Waste

Introduction

This section describes the environmental setting and effects of the remedial action strategies analyzed in this EIR with regard to hazardous materials. Specifically, this section discusses existing hazardous materials conditions within the site, describes the applicable regulations pertaining to the State's approval of the ROD/RAP, and the assessment of substantial adverse effects and mitigation measures of the remedial action strategies in the ROD/RAP. A more detailed assessment of hazardous materials is presented in the ROD/RAP itself, as well as in the investigatory reports that support the ROD/RAP.

Environmental Setting

Regulatory Setting

The State is regulating these environmental actions as environmental response actions in accordance with the provisions of California Health and Safety Code and this constitutes a RAP subject to Chapter 6.8 of Division 20 of the California Health and Safety Code Section 25356.1. The RWQCB, with DTSC support, will be the lead state agency for oversight of the implementation of the ROD/RAP. The RWQCB, as authorized by PCWQCA, will adopt SCRs that will ensure implementation of the final approved ROD/RAP. The State will ensure that environmental assurance actions are taken to address residual concentrations of inboard area-wide DDTs and PAHs in soils adjacent to the runway through the imposition of waste discharge requirements governing the implementation of the HWRP.

HAAF is on the state's Hazardous Waste and Substances Sites (Cortese) List, but not on the federal National Priority List. The Cortese List is a compilation of sites with known hazardous materials releases. Government Code section 65962.5 requires the California Environmental Protection Agency to develop at least annually an updated Cortese List. DTSC is responsible for a portion of the information contained in the Cortese List. Other State and local government

agencies are required to provide additional hazardous material release information for the Cortese List.

The Porter–Cologne Water Quality Control Act of 1969

PCWQCA established the State Water Resources Control Board (SWRCB) and divided the state into 9 regional basins, each with a regional RWQCB. The SWRCB is the primary state agency responsible for protecting the quality of the State's surface and groundwater supplies. The San Francisco Bay RWQCB has jurisdiction over the project area. PCWQCA authorizes the SWRCB to draft state policies regarding water quality. In addition, the PCWQCA authorizes the RWQCB to issue Cleanup and Abatement Orders (Site Cleanup Requirements) and Waste Discharge Requirements (WDRs) for discharges that pollute or threaten to pollute surface or groundwater. PCWQCA is discussed further in Section 3.2, "Water Resources."

Residual Contamination in the Main Airfield Parcel and Coastal Salt Marsh Area

Hazardous material contamination at HAAF has been studied and documented over the past 10-15 years. As part of the BRAC process, remedial efforts are being conducted at HAAF under a sequence of regulatory phases. The Army identified the nature and extent of contamination during a series of assessments and investigations culminating in the Comprehensive Remedial Investigation Report (IT Corporation 1999a). According to the report, a variety of military facilities and functions occurred at Hamilton that could potentially have resulted in soil contamination, including underground storage tanks; aboveground storage tanks; transformers and transformer pads; aircraft maintenance and storage; storm drain and sanitary sewer systems; a former sewage treatment plant; a pump station; fuel lines; revetment areas; construction debris disposal areas; and the PDD, which collected runoff from the base and surrounding areas. Based on historical investigation, the contaminants detected at various sites on the Hamilton property include total petroleum hydrocarbons (diesel, gasoline, jet fuel, or motor oil), metals, dioxins and furans, VOCs, semi-volatile organic compounds, including PAHs, PCBs, and pesticides (IT Corporation 1999a).

Between 1998 and 1999, interim removal actions were completed on many of the sites where elevated levels of contaminants had been found. A description of site investigation and remedial investigation activities is provided in the Comprehensive Remedial Investigation Report (IT Corporation 1999a), interim removal action reports (IT Corporation 1999b, IT Corporation 2000), and the Remedial Design Report (Foster-Wheeler 2000). A human health and ecological risk assessment was prepared for both the inboard and the coastal marsh sites in 2001 (IT Corporation 2001). The Inboard Area Focused Feasibility Study Report (FFS) was completed in 2001 (CH2M Hill 2001) and the Coastal Salt Marsh Focused Feasibility Study Report was completed in 2003 (CH2M Hill 2003).

The purpose of the FFS reports was to identify areas that required further remedial action and to develop, evaluate, and recommend remedial alternatives for these sites to protect human health and the environment in light of the proposed wetland restoration reuse.

In 2001, the U.S. Army Corps of Engineers, St. Louis District, prepared an Archives Search Report (ASR) for the HAAF parcel. The report reviewed historical information concerning site use. Many sites identified in the study were determined to be sites already known to the Army and previously investigated by the Army BRAC environmental restoration program. Further investigation is required for four of the sites identified.

The sites of residual contamination identified in these previous studies and evaluated in the ROD/RAP are summarized in Chapter 2, "Description of Proposed Project." Remedial action strategies and action goals developed in the ROD/RAP for each site are shown in Tables 2-1 and 2-2. For detailed discussion of each site and a description of interim remedial actions completed and recommended alternatives, please refer to the ROD/RAP, or additionally, to the Comprehensive Remedial Investigation Report, Inboard Area Focused Feasibility Study Report, and Coastal Salt Marsh Focused Feasibility Study Report (IT Corporation 1999a, CH2M Hill 2001, CH2M Hill 2003).

Remedies for Residual Contamination in the ROD/RAP

As described in Chapter 2, "Description of the Proposed Project" remedial alternatives were initially developed in the FFS reports. These alternatives were evaluated and refined in the ROD/RAP and through development of goals and objectives of the remedial actions; final remedial alternatives were selected for each site. Goals and objectives developed for the ROD/RAP are predicated on the ultimate use of the HAAF site for wetland development. Thus, inherent in the proposed project is the mitigation of potential risk of exposure to hazardous materials by wetland receptors. The process for selecting remedies for residual contamination in the ROD/RAP is outlined below.

The ROD/RAP evaluates four alternatives to address sites with residual contamination: ROD/RAP Alternative 1, No Further Action; ROD/RAP Alternative 2, Excavation and Offsite Disposal; and ROD/RAP Alternative 3, Manage In-Situ, with Monitoring and Maintenance for Army BRAC Sites. The Army BRAC program will be responsible to perform the environmental response actions for all Army BRAC sites. ROD/RAP Alternative 4, Manage On-site, with Monitoring and Maintenance, was developed specifically for issues that will be addressed by the Army Civil Works Program through the HWRP, and therefore was not evaluated as a possible alternative for the Army BRAC sites. These remedial alternatives are described in detail in the ROD/RAP.

Goals for Residual Contamination in the ROD/RAP

The ROD/RAP first establishes goals for remedial actions to be undertaken at HAAF. The goals developed in the ROD/RAP are numeric limits for residual contamination following site clean up, referred to as action goals. Action goals are based on the type of contaminants identified, the future use of the area where the residual contamination is found, and the risk presented by the specific contaminants to the types of human and ecological receptors likely to be found in the specific area under a wetland development scenario. Contaminants of concern were identified through previous investigations. By evaluating the results of a risk assessment, initial action goals were developed during the FFS phase. These action goals were refined in the ROD/RAP as part of the final remedial selections.

To define action goals, a baseline risk assessment for HAAF was prepared by the Army for coastal salt marsh sites and inboard area sites. The baseline risk assessment estimated the potential risk that the residual contamination at sites within the inboard area may pose to human health and the environment at present, and during the development, maturation, and life of the wetland. The risk assessment assumed that exposure pathways are complete at all sites. Key baseline risk assessment assumptions are as follows.

- Exposures may occur now and in the future because of the chemicals present in the soil or sediment.
- Human and ecological receptors will be present in the future.
- The receptors were assumed to be directly exposed to existing soil or sediment (i.e., the risk assessment did not consider the fact that some sites are covered with concrete or clean fill, or will be covered in the future with imported cover material).
- For the future redevelopment scenario, existing soils will become sediments that support estuarine and freshwater biota.
- The site will not be used for residential or industrial purposes, so these scenarios were not considered in the Human Health Ecological Risk Assessment.

The ecological risk assessment considered both current and future land use scenarios for the inboard sites by evaluating the risks to representative plants and animals under estuarine, freshwater, and grassland habitat scenarios for each site. Exposure pathways associated with direct uptake and ingestion were used to assess the risks to the current and/or future ecological receptors and their associated habitats at the inboard area sites:

The baseline human health ecological risk assessment considered the recreational uses of the grassland and freshwater marsh environments as potentially complete exposure pathways under current land use conditions. Future land use conditions considered recreational uses of the grassland, freshwater marsh, and future estuarine environments as potentially complete exposure pathways. Based on the

proposed land use, current and future land use exposure scenarios for humans were expected to be similar for terrestrial grassland and freshwater marsh environments.

The results of the baseline risk assessment were further evaluated in the FFS to determine how the potential risk should be addressed by proposed remedial actions. The FFS refined the conceptual model used in the baseline risk assessment. Similar to the baseline risk assessment, the FFS conceptual model was based on potential exposure pathways and human and ecological receptors for a wetland end use. However, the baseline risk assessment evaluated every receptor at each site, while the FFS conceptual model identified and evaluated receptors based on the general habitat types (upland, estuarine, freshwater, or recreational) that are expected to be developed at each site. These general habitat types were established by the preferred wetland configuration (Conservancy 1998). Although the wetland design has not been finalized, the general habitat types and receptors at a specific location are not expected to change significantly because of the physical constraints of the site.

The FFS used hazard indices developed in the baseline risk assessment to determine whether a site required remedial action. To require remedial action and evaluation in the FFS, a site had to have at least one receptor with a hazard index greater than 1. The receptors evaluated included those identified in the FFS conceptual model (as described above).

For each remaining site that required further evaluation, the FFS established site-specific FFS contaminants of potential concern based on the receptors that were expected to be present during the development, maturation, and life of the wetland and the potential risk posed by residual contaminants.

The process for determining the action goals and how those action goals would be compared to the sites was refined during development of the ROD/RAP. For each site, the ROD/RAP reevaluated the contaminants of concern presented in the FFS by comparing each site-specific FFS contaminants of potential concern to the action goals established for the ROD/RAP.

For each site, the ROD/RAP identifies contaminants of concern as the contaminants that should be compared to the action goals. Detections of these contaminants of concern above the action goals are evaluated for remedial actions in the ROD/RAP. The action goals are based primarily on site-specific ambient concentrations, in combination with RWQCB-developed numbers for San Francisco Bay Ambient sediments and NOAA effects-range low (ER-L) sediment concentrations. DDTs (DDT and its breakdown products DDE and DDD) have been found throughout the HAAF in surface soils. DDTs are persistent and bioaccumulative toxic substances. Based on professional judgment, in order to protect future receptors from potential risks associated with DDTs, the Army, DTSC, and RWQCB agreed that soils containing a total concentration of DDTs in excess of 1 part per million (ppm) will be excavated and disposed of offsite. DDT action goals are derived from risk based calculations protective of the California clapper rail. Sites not addressed in the

Army's risk assessment (e.g., area-wide DDT contamination, PAHs adjacent to the runways, and ASR sites) would also be subject to the action goals proposed in the ROD/RAP.

Objectives for Remedial Actions in the ROD/RAP

To guide the process of selecting remedial alternatives, Remedial Action Objectives (RAOs) are developed in the ROD/RAP to define the ultimate aim of the remediation and evaluate the ability of the different alternatives to achieve these aims. RAOs in the ROD/RAP were developed for the three main categories of contamination issues.

Army BRAC Sites

The RAOs for the Army BRAC sites are to prevent or mitigate the exposure of ecological and human receptors to soil and/or sediment containing concentrations of site specific contaminants of concern that are greater than their respective action goals at a given site. This can be accomplished by reducing the concentrations of residual contaminants of concern that are greater than their action goals or by controlling or eliminating the exposure of receptors to residual contaminants of concern that are greater than their action goals.

Other Army BRAC Environmental Considerations

Other Army BRAC Environmental Considerations includes the GSA/BRAC Soil Stockpiles and the ASR sites. The RAOs for the other Army BRAC Environmental Consideration sites are to prevent or mitigate the exposure of ecological and human receptors to soil and/or sediment containing concentrations of chemicals that are greater than the established action goals. This can be accomplished by reducing the concentrations of residual contaminants of concern that are greater than their action goals or by controlling or eliminating the exposure of receptors to residual contaminants of concern that are greater than their action goals.

HWRP Issues

HWRP Issues includes area-wide DDTs, PAHs near the runway, and soil contaminated with lead-based paint. The RAOs for the HWRP issues are to prevent or mitigate the exposure of ecological and human receptors to soil containing concentrations of contaminants of concern that are greater than their respective action goals for these issues.

Remedial Selection Process

This subsequent EIR has been prepared pursuant to CEQA due to the discretion exercised by DTSC and RWQCB in their consideration of the ROD/RAP for approval. The selection of the remedy by DTSC and the RWQCB is based on their authority to approve RAPs as set forth in Section 25356.1 of the California Health and Safety Code. The statutory requirements governing selection of the remedy are also contained in Health and Safety Code Section 25356.1.5. In summary, any remedy selected in a RAP must be based on, and be no less stringent than, requirements of the NCP (40 Code of Federal Regulations [CFR] Part 300), regulations and applicable requirements contained in Division 7 of the Water Code, regulations promulgated thereunder, resolutions issued by SWRCB and the San Francisco Bay Regional Water Quality Control Plan and applicable provisions of Chapter 6.8 of Division 20 of the Health and Safety Code.

Approval of a RAP by DTSC and the RWQCB under Health and Safety Code Section 25356.1 must consider

- health and safety risks posed by conditions at the site, including scientific data and reports that may have a relationship to the site;
- the effect of contamination or pollution levels on present, future, and probable beneficial uses of contaminated, polluted, or threatened resources;
- the effect of alternative remedial action measures on the reasonable availability of groundwater resources for present, future, and probable beneficial uses;
- site-specific characteristics, including the potential for off-site migration of hazardous substances, the surface or subsurface soil, and the hydrogeologic conditions, as well as preexisting background contamination levels;
- cost-effectiveness of alternative remedial action measures; and
- potential environmental impacts of alternative remedial action measures.

DTSC and the RWQCB have determined that the action goals selected in the ROD/RAP meet the applicable laws and requirements of the State. DTSC and the RWQCB have also determined that the remedies selected in the ROD/RAP are in compliance with the requirements of the California Health and Safety Code.

Environmental Impacts and Mitigation Measures

Approach and Methodology

The assessment evaluates the potential for remediation activities under the proposed remedial action strategies to adversely affect the environmental conditions within the Hamilton Main Airfield Parcel and adjacent coastal salt

marsh area with respect to hazardous materials. The assessment of adverse effects related to hazardous materials was based on the findings of the ROD/RAP (CH2M Hill 2003).

Thresholds of Significance

The proposed project may result in substantial adverse effects related to hazardous materials if they would create a potential hazard to public health or the environment from the release of on-site contaminants.

Impacts and Mitigation Measures of the Proposed Project

Impact HAZ-1: Create a Significant Hazard to the Human Health or the Environment from Contaminants Remaining on the Site. The ROD/RAP develops specific action goals and remedial action objectives that define how each contaminant at each site should be addressed. These goals and objectives are defined specifically to be protective to potential human and ecological receptors.

As a result residual contamination remaining on the site through the no further action strategy would be at levels below defined action goals and therefore would not present a significant risk to human or ecological health under the proposed future use of the site for wetlands restoration.

Contaminants identified at sites where the selected remedy is excavation with offsite disposal are not expected to be released into the environment. Excavation of contaminated material would continue at these sites until the action goals are achieved. The one exception would be sites in the coastal salt marsh where it may become infeasible (due to depth) to continue excavation until contaminants can be reduced to below action goals. The inability to achieve action goals and suspension of excavation would be based on concurrence from the State and the Army that residual contamination would not pose a significant risk to human or ecological health. Contamination at depth in a marsh environment generally presents less of a risk than contaminants present in surface sediments. In accordance with the ROD/RAP, institutional controls would be required in the form of land use restrictions to ensure that future exposure of contaminants to human or environmental receptors does not occur.

Contaminants identified at sites to be managed under the in-situ or on-site remedial action strategies are similarly not expected to be released into the environment. For these sites, a performance standard is developed in the ROD/RAP requiring 3 feet of stable cover or equivalent. In doing so, potential risks to future wetland receptors caused by exposure to contaminants above action goals would be reduced to levels that would not result in significant risks to human or ecological health. In addition to the three feet of stable cover,

potential exposure through reintroduction of the contaminants into the environment would be further prevented by institutional controls placed on the site to prevent excavation of the soils, or development of the site for potentially sensitive human uses not evaluated in the existing risk assessment. Potential exposure of these sites through channel scour is discussed below in Impact HAZ-2.

The ROD/RAP remedial strategies were selected to avoid and reduce significant risks to human and ecological receptors in light of the proposed wetland reuse. Thus, implementation of the ROD/RAP and the HWRP is not expected to create a significant hazard to the public or the environment, and thus this impact is considered less than significant.

Impact HAZ-2: Create a Significant Hazard to the Human Health or the Environment from Release of Contaminants by Channel Scour. Many sites of residual contamination are proposed to remain on the property through either in-situ or onsite management strategies. These contaminants would receive stable cover from either dredge materials placed on the site for the HWRP, or other sources of appropriate material. Future development and maturation of the proposed wetland may expose these contaminants as the wetland channels develop and, through tidal action, begin to cut into the sediments on site. Because final morphological modeling to assess the location and depth of channel scour has not been completed, contaminants proposed to remain in place or onsite may be within areas of channel scour and be exposed to the water column. The ROD/RAP conditions the ultimate selection of remedial alternatives on final morphological modeling. The ROD/RAP requires that any site proposed for in-situ management would be addressed through excavation and offsite disposal if, based on the final modeling and HWRP design, it is determined that the performance standard of 3 feet of stable cover, or equivalent, cannot be achieved. On-site management of DDT and PAH contaminated soils is similarly required under the ROD/RAP to be guided by the final morphological model and design for the HWRP.

Implementation of these ROD/RAP remedial strategies would prevent environmental exposure of contaminants above the remedial action goals due to tidal scour and thus this impact is considered less than significant.

Impact HAZ-3: Create a Significant Hazard to the Human Health or the Environment through the Release of Contaminants during Site Clean Up. Implementation of the remedial action strategies would involve excavation of contaminated soils and other on-site construction activity. Potential threats to human and environmental health could also occur during off-site transport of contaminated soil.

All remediation of the site would be conducted pursuant to OSHA guidelines to protect worker health and safety. The site is not open to the public. Best Management Practices would be implemented and monitored during excavation, transfer, and transport of contaminated soils on and offsite to ensure the safety of the surrounding environment and sensitive receptors (the BMPs are described in greater detail in Section 3.2, "Water Resources," and 3.8, "Air Quality"). With

implementation of relevant water quality and air quality BMPs, site remediation is not expected to create a significant hazard to the public or the environment and thus this impact is considered less than significant.

Section 3.7

Transportation

Data Sources

Information presented in this section was derived primarily from the HWRP EIR/EIS (Conservancy 1998) and the Hamilton Army Airfield Disposal and Reuse EIS (U.S. Army Corps of Engineers 1996).

Environmental Setting

Regional Access

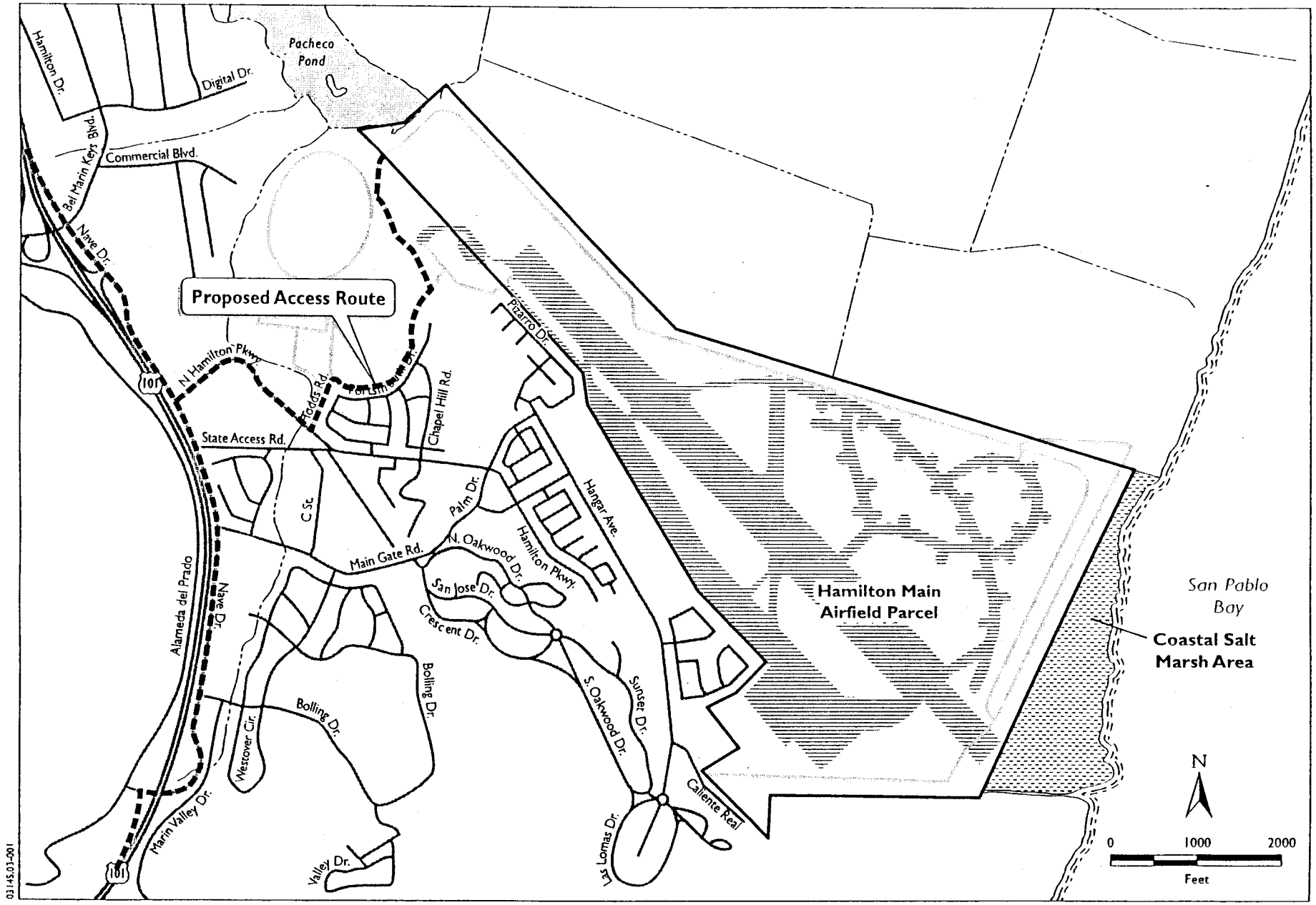
Regional access to the project area is provided by U.S. Highway 101 and State Route 37. U.S. Highway 101 is a principal north-south freeway connecting HAAF to Sonoma County to the north and to the San Francisco Bay Area to the south. State Route 37 extends east from U.S. Highway 101 in Novato to Interstate 80 in Vallejo. Figure 3.7-1 identifies major roadways in the project area.

Access to the Project Area

Access to the HAAF parcel is currently provided by Ignacio Boulevard, Alameda del Prado, Nave Drive, Main Gate Road, and State Access Road. All vehicles traveling to and from HAAF currently use Nave Drive. This two-lane road extends north from Alameda del Prado to the U.S. Highway 101 interchange at Ignacio Boulevard. Nave Drive connects to Main Gate Road and State Access Road, which provide access to HAAF.

Access to remediation sites in the inboard area and near the eastern perimeter levee would be primarily via the runway, taxiways, and other existing internal access roads.

No public roads occur in the HAAF parcel. Access around the area is provided by Perimeter Road. The number of trips made to the HAAF parcel is unknown; however, the area is not open to the public.



Jones & Stokes

Figure 3.7-1
...sportation Network in the Project Area

As described in Chapter 2, all materials transported to and from the site would follow an established access route (Figure 2-6). From the project site, the designated route would follow an unpaved access road from the northwestern end of the airfield, around the eastern perimeter of Landfill 26, to the intersection with Todd's Road. At Todd's Road the route would turn left and proceed approximately 0.25 mile to the intersection with North Hamilton Parkway. The route would turn right on North Hamilton Parkway and proceed west to Nave Drive. Depending on the destination, vehicles would either turn right on Nave Drive to access Highway 101 north at the Bel Marin Keys entrance, or turn left on Nave Drive to access Highway 101 south at Alameda del Prado entrance.

Existing Levels of Service

Traffic and transportation movement is measured by a level of service (LOS) rating, which ranges from A to F. LOS A is operationally the most efficient and generally exhibits the least amount of traffic delay and resulting congestion. Each successive LOS (B through F) is less operationally efficient. Standard descriptions of LOS are provided in Tables 3.7-1 and 3.7-2.

Table 3.7-1 Unsignalized Intersection LOS Criteria

Level of Service	Description	Average Control per Vehicle (Seconds)
A	Few or no delays.	≤ 10.0
B	Short traffic delays.	> 10.0 to 15.0
C	Average traffic delays.	> 15.0 to 25.0
D	Long traffic delays.	> 25.0 to 35.0
E	Very long traffic delays	> 35.0 to 50.0
F	Extreme traffic delays with intersection capacity exceeded.	> 50.0

Source: Transportation Research Board Highway Capacity Manual 2000.

The existing LOS for critical intersections in the project area was estimated for the 1998 HWRP EIR/EIS. Levels of service ranged from A to D during a.m. and p.m. peak hours (Table 3.7-3). The LOS for peak-hour freeway operations was estimated to range from E to F on U.S. Highway 101 and was estimated at C to D on State Route 37 between U.S. Highway 101 and Atherton Avenue (Table 3.7-4).

Table 3.7-2. Signalized Intersection LOS Criteria

LOS	Sum of Critical Volume-to-Capacity Ratio	Description
A	< 0.60	Operations with very low control delay, up to 10 seconds per vehicle. This LOS occurs when progression is extremely favorable and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.
B	0.61 – 0.70	Operations with control delay greater than 10 and up to 20 seconds per vehicle. This level generally occurs with good progression, short cycle lengths, or both. More vehicles stop than with LOS A, causing higher levels of average delay.
C	0.71 – 0.80	Operations with control delay greater than 20 and up to 35 seconds per vehicle. These higher delays may result from fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level, though many still pass through the intersection without stopping.
D	0.81 – 0.90	Operations with control delay greater than 35 seconds and up to 55 seconds per vehicle. At level D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high v/c ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.
E	0.91 – 1.00	Operations with control delay greater than 55 and up to 80 seconds per vehicle. This level is considered by many agencies to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high v/c ratios. The individual cycle failures are frequent occurrences.
F	> 1.00	Operation with control delay in excess of 80 seconds per vehicle. This level is considered to be unacceptable with oversaturation, that is, when arrival flow rates exceed the capacity of the intersection. It may also occur at high v/c ratios below 1.0 with many individual cycle failures. Poor progression and long cycle lengths may also be contributing factors to such delay levels.

Source: Contra Costa Transportation Authority, Technical Procedures 1997.

Table 3.7-3. Summary of Intersection Levels of Service and Peak-Hour Freeway Operations

	Intersection	LOS A.M.	LOS P.M.
1.	Ignacio Boulevard/U.S. Highway 101 southbound ramps	D	C
2.	Ignacio Boulevard/U.S. Highway 101 northbound on-ramp	B	D
3.	Nave Drive/U.S. Highway 101 northbound off-ramp	B	D
4.	Nave Drive/State Access Road	A	D
5.	Nave Drive/Main Gate Road	C	D
6.	Nave Drive/U.S. Highway 101 northbound ramps	A	A
7.	Alameda del Prado/Clay Court	C	C
8.	Alameda del Prado/U.S. Highway 101 southbound ramps	A	A

Note: The capacity analysis for cumulative conditions was based on the roadway network improvements developed for the Hamilton Field Project. These improvements include modifications to the U.S. Highway 101/Ignacio Boulevard interchange, addition of lanes to some of the critical intersections, and signalization of the unsignalized intersections.
Source: U.S. Army Corps of Engineers 1996

Table 3.7-4. Year 2010 Freeway Capacity

Freeway Segment	Capacity Each Direction	Year 2010 Peak Direction A.M. Southbound Volume	LOS	P.M. Northbound Volume	LOS
U.S. Highway 101 - Lucas Valley Rd. to Miller Creek Rd.	7,200	8,540	F	7,750	F
U.S. Highway 101 - Miller Creek Rd. to Alameda del Prado	8,100	8,660	F	7,870	E
U.S. Highway 101 - Alameda del Prado to Ignacio Blvd.	7,200	8,020	F	7,600	F
U.S. Highway 101 - Ignacio Blvd. to State Route 37	8,100	8,880	F	9,080	F
U.S. Highway 101 - State Route 37 to Rowland Blvd.	5,400	6,360	F	6,470	F
U.S. Highway 101 - Rowland Blvd. to De Long Ave.	5,400	5,280	E	5,550	F
U.S. Highway 101 - De Long Ave. to Atherton Ave.	5,400	6,370	F	6,130	F
U.S. Highway 101 - Atherton Ave. to Marin/Sonoma County line	4,400	5,100	F	5,230	F
State Route 37 - U.S. Highway 101 to Atherton Ave.	3,600	3,010	D	2,750	C

Environmental Impacts and Mitigation Measures

Transportation impacts of the proposed project would be associated primarily with worker trips to the site and transporting materials from the excavation sites to the landfill.

Approach and Methods

The proposed project could result in impacts associated with the excavation and disposal of contaminated soils and the transportation of fill material to the project area. Construction-related impacts would also result from trips to and from the project site by construction workers. Impacts related to monitoring and adaptive management activities could occur as a result of trips made to the site by caretakers, researchers, or visitors.

Use of LOS as a quantitative method for describing traffic conditions on intersections and road segments has been discussed above. This evaluation is based on the traffic model used by the Army in the HAAF Disposal and Reuse EIS (U.S. Army Corps of Engineers 1996) to evaluate the impacts of different reuse scenarios on roadway LOS in the project area. (The model was first developed to evaluate buildout of the New Hamilton Partnership development.)

The model predicted the LOS for eight intersections in the project vicinity and nine major highway segments (eight segments of U.S. Highway 101 and one segment of State Route 37). The results of the analysis of no-action conditions from the HAAF Disposal and Reuse EIS were used to characterize conditions if the HAAF parcel is not reused and the HWRP is not implemented, while representing buildout of the New Hamilton Partnership project. These "no-action" or baseline conditions were used as a basis for comparison to traffic conditions if the HWRP is implemented.

The total number of daily trips generated during site remediation was based on estimates in the ROD/RAP of the nature of remedial activities, including the amount of material to be excavated, graded, or stockpiled on the site; the time needed to complete remedial activities; and assumptions about the number of pieces of construction equipment required. Trip generation estimates are provided in Appendix C. The number of peak employees was estimated by assuming one employee per construction vehicle/equipment at peak. A total of 26 vehicles/equipment, and therefore 26 employees, were presumed as the estimate of potential peak activity.

Each worker was presumed to arrive and depart the work site in his or her own personal vehicle. Some workers may commute together, but the assumption of individual vehicles is conservative. Fifty-two daily commute trips were estimated for period of peak activity on-site: 26 trips during the morning commute peak hours and 26 trips during the evening commute peak hours. In addition, 26 additional trips during the lunch hour were presumed, assuming that half of the worker vehicle are used to go off-site for lunch or to run errands.

A total of 8 large dump trucks are presumed to be in use to haul soil off to appropriate disposal sites at the point of peak activity. The characterization of the material will determine the requisite disposal site. As a conservative estimate, it was presumed that 90 percent of the soil is hauled to the Altamont Landfill in Alameda County; 5 percent to the Redwood Sanitary Landfill in Novato; and 5 percent to the Kettleman Hills Landfill in Kettleman City. Each

dump truck was assumed to make two runs per day, resulting in a total of 32 haul trips per day at peak.

Based on these estimates, at times of peak remedial activity, the estimated total trips would be 110 trips per day. It was assumed that most morning truck trips from the site would not occur during the morning peak commute because trucks are presumed to be loaded on-site in the morning and hauled out during the day; thus, 25 percent (2 trips) of the morning haul (outbound) trips were assumed to occur during the morning commute peak hours. Afternoon return haul trips could occur during the evening peak period; thus 75 percent (6 trips) of the inbound trips were presumed to occur during evening peak commute hours. The remainder of the morning and afternoon truck trips were assumed to occur at off-commute peak hours. The 26 trips during the lunch hour would be off-commute peak hour trips.

Thus, it was estimated that, at peak level of remedial activity, a total of 28 trips would occur during morning commute peak hours and 32 trips would occur during afternoon commute peak hours.

Thresholds of Significance

According to Appendix G of the State CEQA Guidelines, a project will normally have a significant impact on the environment if it would result in an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system.

Impacts and Mitigation Measures of the Proposed Project

Impact T-1: Change in LOS at Important Intersections and Roadway Segments during Construction. As indicated under "Approach and Methods" above, remediation activities at the project site are estimated to increase the number of vehicle trips to the project site by a maximum of 52 trips per day. Based on the LOS for intersections and roadway segments shown in Table 3.7-3, the daily increase in traffic would not change LOS on roadway segments or important intersections. In addition, most truck trips associated with hauling of materials from the site would occur during off peak hours. Because the minor increase in daily traffic is not expected to result in a change in LOS, the impact on transportation of the proposed project is considered less than significant and no mitigation is required.

Impact T-2: Impacts to Freeway LOS during Remediation. The proposed project would add approximately 52 vehicle trips per day to the roadway network during the highest level of activity. It is estimated that 28 trips and 32 trips would occur on area freeways (Highways 101 and 37) during the

morning or evening peak period, respectively. The addition of peak period vehicle trips would result in additional traffic on segments of Highways 101 and 37 that currently operate at LOS F during the peak periods. The addition of these peak hour trips is considered to be a significant and unavoidable impact to the area freeway system.

Section 3.8

Air Quality

Data Sources

The Bay Area Air Quality Management District (BAAQMD) guidelines for assessing air quality impacts were used to evaluate the environmental effects of the project (BAAQMD 1999).

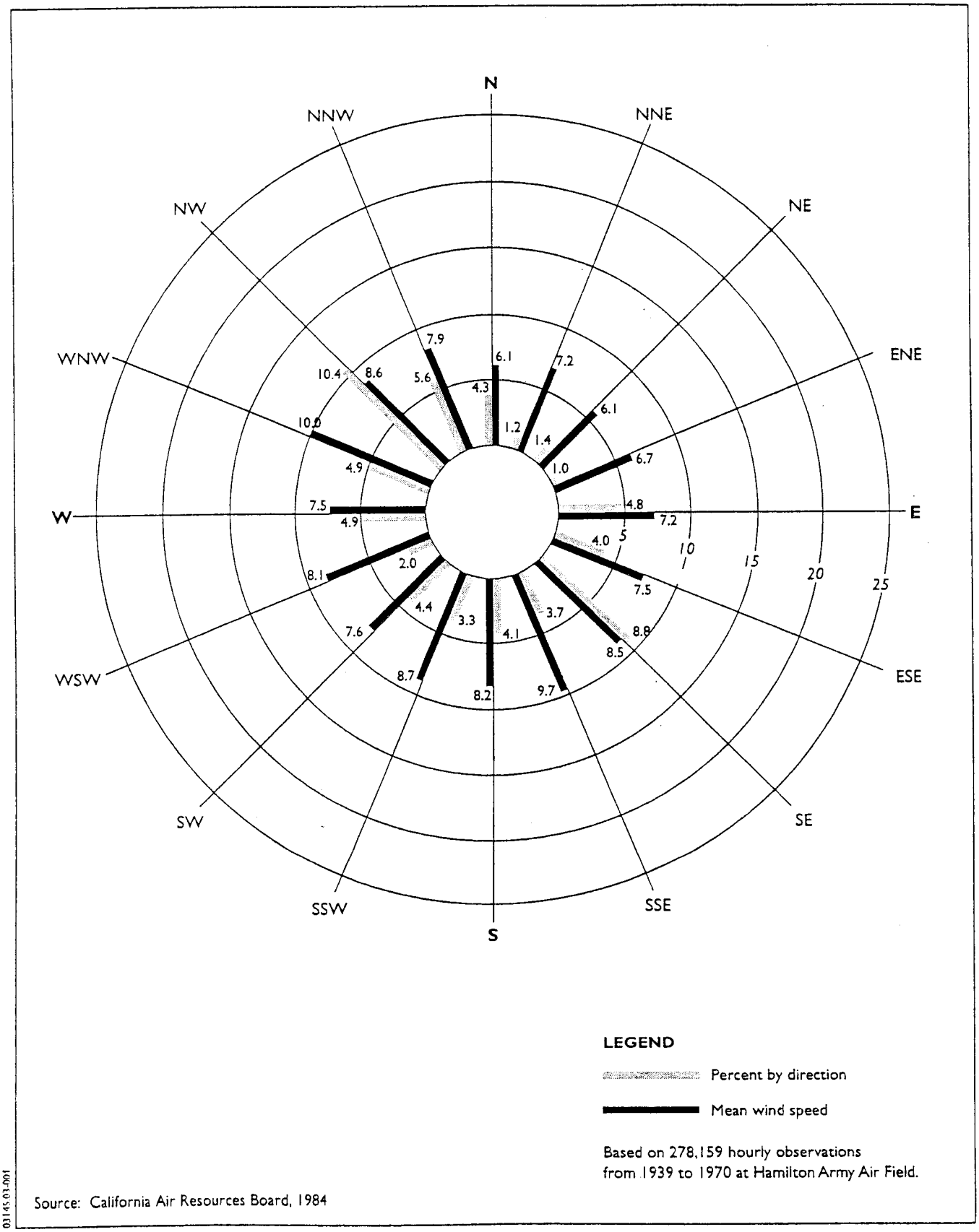
Environmental Setting

Regional Topography and Climate

The concentration of a given pollutant in the atmosphere is determined by the amount of pollutant released by various sources combined with the atmosphere's ability to transport and dilute the pollutant. The major determinants of air pollution transport and dilution are wind, atmospheric stability, terrain, and exposure to sunlight (insolation).

The project site is within the San Francisco Bay Area Air Basin (SFBAAB), which includes the City of San Francisco; portions of Sonoma and Solano Counties; and all of San Mateo, Santa Clara, Alameda, Contra Costa, Marin, and Napa Counties. The project area is characterized by warm, dry summers and cool, moist winters. The topography is generally flat with elevations of less than 100 feet above sea level.

The predominant annual wind direction is from the northwest. During spring and fall, the predominant direction is from the west-northwest. The predominant wind direction is from the east-southeast during summer and from the north-northwest during winter. Mean wind speeds range from 5 to 10 miles per hour, and calm winds occur 31.3 percent of the time. (California Air Resources Board 1984). The wind rose for a meteorological station located at HAAF, which shows the percentage of time wind blows in each direction and the mean wind speed by direction, is shown in Figure 3.8-1.



Source: California Air Resources Board, 1984

03145.01-001

Jones & Stokes

Figure 3.8-1
Windrose Depicting Average Wind Speed and Directional Frequency at Hamilton Army Airfield

Federal and State Ambient Air Quality Standards

The State of California and the federal government have each established ambient air quality standards for air pollutants (see Table 3.8-1, following page). For some pollutants, separate standards have been set for different periods. Most standards are established to protect public health; however, for some pollutants, standards have been based on other values, such as protection of crops, protection of materials, or avoidance of nuisance conditions.

The air pollutants of greatest concern in the area include carbon monoxide (CO), ozone, and inhalable particulate matter less than 10 microns in diameter (PM_{10}).

Attainment Status

The SFBAAB is currently classified as a nonattainment area for both the state and federal ozone standards, and for state PM_{10} standards. The SFBAAB is in attainment of the federal PM_{10} standards, state and federal nitrogen dioxide and sulfur dioxide standards, and state CO standards. The SFBAAB is a maintenance area for the federal CO standards.

Air Quality Management Programs

Air pollution control programs were established in California before the enactment of federal requirements. Federal Clean Air Act legislation in the 1970s resulted in a gradual merger of local and federal air quality programs, particularly industrial-source air quality permit programs. Development of air quality management planning programs during the past decade has generally been in response to requirements established by the federal Clean Air Act.

Table 3.8-1. Federal and State Ambient Air Quality Standards

Pollutant	Averaging Time	State Standard	Federal Standard
Ozone	8 hours	—	0.08 ppm
	1 hour	0.09 ppm (180 $\mu g/m^3$)	0.12 ppm (235$\mu g/m^3$)
CO	8 hours	9.0 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)
	1 hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)
Nitrogen Dioxide	annual average	—	0.053 ppm (100 $\mu g/m^3$)
	1 hour	0.25 ppm (470 $\mu g/m^3$)	—
Sulfur Dioxide	annual average	—	80 $\mu g/m^3$ (0.03 ppm)
	24 hours	0.04 ppm (105 $\mu g/m^3$)	365 $\mu g/m^3$ (0.14 ppm)
	1 hour	0.25 ppm (655 $\mu g/m^3$)	—
PM_{10}	annual arithmetic mean	—	50 $\mu g/m^3$
	annual geometric mean	30 $\mu g/m^3$	—
	24 hours	50 $\mu g/m^3$	150 $\mu g/m^3$
Particulate Matter—Fine ($PM_{2.5}$)	annual arithmetic mean	—	15 $\mu g/m^3$
	24 hours	—	65 $\mu g/m^3$
Sulfates	24 hours	25 $\mu g/m^3$	—
Lead	calendar quarter	—	1.5 $\mu g/m^3$
	30-day average	1.5 $\mu g/m^3$	—
Hydrogen Sulfide	1 hour	0.03 ppm (42 $\mu g/m^3$)	—
Vinyl Chloride (chloroethene)	24 hours	0.010 ppm (26 $\mu g/m^3$)	—
Visibility-Reducing Particles	8 hours (1000–1800 PST)	*	—

Notes: ppm = parts per million
mg/m^3 = milligrams per cubic meter
$\mu g/m^3$ = micrograms per cubic meter

* Statewide VRP Standard (except Lake Tahoe Air Basin): Particles in sufficient amount to produce an extinction coefficient of 0.23 per kilometer when the relative humidity is less than 70%. This standard is intended to limit the frequency and severity of visibility impairment due to regional haze and is equivalent to a 10-mile nominal visual range.

The enactment of the California Clean Air Act in 1988 and the federal Clean Air Act Amendments of 1990 has produced additional changes in the structure and administration of air quality management programs. The California Clean Air Act requires preparation of an air quality attainment plan for areas that violate state air quality standards for CO, sulfur dioxide, nitrogen dioxide, or ozone. No locally prepared attainment plans are required for areas that violate the state PM_{10} standards. The California Air Resources Board addresses PM_{10} attainment issues in *California Air Quality Data* (California Air Resources Board 1993).

Air pollution problems in the SFBAAB result primarily from locally generated emissions. The SFBAAB, however, has been identified as a source of ozone-precursor emissions that occasionally contribute to air quality problems in the Monterey Bay area, the northern San Joaquin Valley, and the southern Sacramento Valley. Consequently, air quality planning efforts for the SFBAAB must reduce the area's impact on downwind air basins as well as correcting local air pollution problems.

The BAAQMD has recently prepared two air quality plans designed to bring the SFBAAB into attainment with ozone standards. The 1999 Ozone Attainment Plan was designed to bring the SFBAAB into attainment with the federal ozone ambient air quality standards. On December 20, 2000, the BAAQMD also adopted the 2000 Clean Air Plan (BAAQMD 2000). The current plan represents the third triennial update of the 1991 Clean Air Plan. It contains additional rules and regulations that are designed to bring the SFBAAB into attainment with the California ozone ambient air quality standards.

The Bay Area did not attain the federal ozone standard by the 2000 deadline stipulated in the 1999 Ozone Attainment Plan. As a result, the U.S. Environmental Protection Agency (EPA) disapproved the 1999 Ozone Attainment Plan and required preparation of a new plan providing for an updated volatile organic compounds and nitrogen oxides emissions inventory and new transportation conformity budgets. In response, the BAAQMD developed the San Francisco Bay Area 2001 Ozone Attainment Plan for the 1-Hour National Ozone Standard (2001 Plan). The 2001 Plan was formally adopted by the BAAQMD, the Metropolitan Transportation Commission, and the Association of Bay Area Governments on October 26, 2001. In November 2001, the California Air Resources Board also approved the 2001 Plan and submitted it to the EPA for review and approval. The 2001 Plan is currently in EPA review (BAAQMD 2002).

The deadline for attainment of the federal ozone standard under the 2001 Plan is 2006. The 2001 Plan contains a control strategy that incorporates seven new stationary source measures, five new transportation control measures, and 11 further-study measures. The 2001 Plan also includes a commitment to strengthen the Smog Check Program and a new assessment of attainment status based on the available data for the Bay Area. Attainment status will be reevaluated in 2003, using data from the Central California Ozone Study. In 2004, a revised State Implementation Plan incorporating any necessary

modifications to the control strategy will be submitted to the EPA (BAAQMD 2002).

Existing Air Quality Conditions

The existing air quality conditions in the area are characterized by air quality monitoring data collected in the region. PM_{10}, CO, and ozone concentrations are measured at several north Bay monitoring stations. Recent monitoring data are presented on the following page in Table 3.8-2. The closest monitoring station is located in San Rafael. A description of the major pollutants found in the area is provided below.

Ozone

Ozone is a respiratory irritant and an oxidant that increases susceptibility to respiratory infections and can cause substantial damage to vegetation and other materials. Ozone is a severe eye, nose, and throat irritant. Ozone also attacks synthetic rubber, textiles, plants, and other materials. Ozone causes extensive damage to plants by leaf discoloration and cell damage.

State and federal standards for ozone have been set for a 1-hour averaging time. The state 1-hour ozone standard is 0.09 parts per million (ppm), not to be exceeded more than 3 days in 3 years. The federal 1-hour ozone standard is 0.12 ppm, not to be exceeded more than 3 times in any 3-year period. The monitoring data has shown few instances where exceedances of the ozone state standard occurred during the 3 most recent years for which data are available.

Ozone is not emitted directly into the air but is formed by a photochemical reaction in the atmosphere. Ozone precursors, which include reactive organic gases (ROG) and oxides of nitrogen (NOx), react in the atmosphere in the presence of sunlight to form ozone. Because photochemical reaction rates depend on the intensity of ultraviolet light and air temperature, ozone is primarily a summer air pollution problem. The ozone precursors, ROG and NOx, are emitted by mobile sources and by stationary combustion equipment.

Table 3.8-2. Ambient Air Quality Monitoring Data Recorded at San Rafael Monitoring Station

Pollutant Standards	1999	2000	2001
Ozone (O_3)			
Maximum 1-hour concentration (ppm)	0.102	0.071	0.090
No. Days Standard Exceeded			
NAAQS (1-hour) > 0.12 ppm	0	0	0
CAAQS (1-hour) > 0.09 ppm	2	0	0
Carbon Monoxide (CO)			
Maximum 8-hour concentration (ppm)	2.9	2.3	2.4
Maximum 1-hour concentration (ppm)	5.6	4.2	5.2
No. Days Standard Exceeded			
NAAQS (8-hour) ≥ 9.0 ppm	0	0	0
NAAQS (1-hour) ≥ 35 ppm	0	0	0
CAAQS (8-hour) ≥ 9.0 ppm	0	0	0
CAAQS (1-hour) ≥ 20 ppm	0	0	0
Particulate Matter			
Maximum 24-hour concentration ($\mu g/m^3$)	75.6	39.5	79.0
2nd highest 24-hour concentration ($\mu g/m^3$)	64.4	38.7	54.0
Average arithmetic mean concentration ($\mu g/m^3$)	22.0	19.5	20.4
Average geometric mean concentration ($\mu g/m^3$)	19.5	18.2	18.1
No. Days Standard Exceeded			
NAAQS (24-hour) > 50 $\mu g/m^3$	0	0	0
CAAQS (24-hour) > 150 $\mu g/m^3$ (recorded every 6 days)	2	0	2

Notes: NAAQS = National Ambient Air Quality Standards
CAAQS = California Ambient Air Quality Standards
ppm = parts per million
µg/m3 = micrograms per cubic meter

Source: BAAQMD 2003

Carbon Monoxide

CO is essentially inert to plants and materials but can have significant effects on human health. CO is a public health concern because it combines readily with hemoglobin and thus reduces the amount of oxygen transported in the bloodstream. Effects on humans range from slight headaches and nausea to death.

State and federal CO standards have been set for both 1-hour and 8-hour averaging times. The state 1-hour standard is 20 ppm by volume, and the federal 1-hour standard is 35 ppm. Both state and federal standards are 9 ppm for the 8-hour averaging period. The monitoring data shows no recorded violations of the CO standards during the 3 most recent years for which data are available.

Motor vehicles are the dominant source of CO emissions in most areas. High CO levels develop primarily during winter when periods of light wind combine with the formation of ground-level temperature inversions (typically from the evening through early morning). These conditions result in reduced dispersion of vehicle emissions. Motor vehicles also exhibit increased CO emission rates at low air temperatures.

Particulates

Health concerns associated with suspended particulate matter focus on particles small enough to reach the lungs when inhaled. Particulates can damage human health and retard plant growth. Particulates also reduce visibility, soil buildings and other materials, and corrode substances. The primary particulate of concern in the area is PM_{10}.

The state PM_{10} standards are 50 micrograms per cubic meter as a 24-hour average and 30 micrograms per cubic meter as an annual geometric mean. The federal PM_{10} standards are 150 micrograms per cubic meter as a 24-hour average and 50 micrograms per cubic meter as an annual arithmetic mean. The monitoring data shows a few exceedances of the state PM_{10} 24-hour standard during the 3 most recent years for which data are available.

PM_{10} emissions are generated by a wide variety of sources, including agricultural activities, industrial emissions, dust suspended by vehicle traffic, and secondary aerosols formed by reactions in the atmosphere.

Sensitive Receptors

Sensitive receptors in the project area include residences to the south, west, and north of HAAF. The Hamilton Elementary School is located on Main Gate Road

approximately 1.1 miles west of the western edge of the HAAF main airfield parcel.

Environmental Impacts and Mitigation Measures

Analytical Methods

The approach used in evaluation of air quality impacts is generally qualitative and follows requirements outlined by the BAAQMD. The BAAQMD's approach to analysis of construction impacts is to emphasize implementation of effective and comprehensive control measures rather than detailed quantification of emissions (BAAQMD 1999).

Impact Mechanisms

Remediation activities on the site may disturb and release contaminants into the air. Certain contaminants identified on the site, such as total petroleum hydrocarbons, may volatilize during remediation activities. However, most contaminants identified on the site are molecularly heavy, nonvolatile compounds that bind to soil. The primary concern with regard to remediation-related pollution emissions is therefore fugitive dust.

PM_{10} emissions can result from a variety of construction activities, including excavation, grading, demolition, vehicle travel on paved and unpaved roads, and emission of vehicle and equipment exhaust. Construction-related emissions of PM_{10} can vary greatly depending on the level of activity, the specific operations occurring, the equipment being operated, local soils, weather conditions, and other factors. Construction-related emissions can cause substantial increases in localized concentrations of PM_{10}. Particulate emissions from construction activities can lead to adverse health effects as well as nuisance concerns such as reduced visibility and soiling of exposed surfaces. Contaminants in soils removed or relocated as part of the proposed project are discussed further in Section 3.6, "Hazardous Substances and Waste."

Construction equipment emits CO and ozone precursors. However, these emissions are included in the emission inventory that is the basis for the regional air quality plans. Construction activities are not expected to impede attainment or maintenance of ozone and CO standards in the Bay Area (BAAQMD 1996). Project impacts on CO are assumed to be less than significant and are not evaluated further.

Thresholds of Significance

Based on the State CEQA Guidelines and professional standards, a project is considered to have a significant impact on air quality if it would

- violate any air quality standard or contribute substantially to an existing or projected air quality violation,
- expose sensitive receptors to substantial pollutant concentrations,
- create objectionable odors affecting a substantial number of people, or
- conflict with or obstruct implementation of the applicable air quality management plan.

Specific emissions thresholds are contained in BAAQMD's *CEQA Guidelines for Assessing the Air Quality Impacts of Projects and Plans* (BAAQMD 1999).

Impacts and Mitigation Measures of the Proposed Project

Impact A-1: Emissions of Fugitive Dust from Remediation Activities. As described in the above discussion of impact mechanisms, implementation of the proposed ROD/RAP would result in fugitive dust emissions (including PM_{10}) produced by grading, excavation, and transport of materials on the site. As discussed in the ROD/RAP, some of the soils on the site contain residual contaminants. Fugitive dust generated during remediation may thus contain residual contaminants that are present is site soils. This impact would be considered significant. To reduce this impact to a less-than-significant level, the following mitigation measure would be implemented.

Mitigation Measure A-1: Control Fugitive Dust Emissions in Accordance with BAAQMD Standards. The following control measures would be applied at the site, as necessary, to control fugitive dust. Because of the nature of the contaminated soils on the site and the project's location near sensitive receptors, enhanced control measures would also be required, as necessary, to control fugitive dust.

Basic Control Measures

- Water all active construction areas at least twice daily.
- Cover all trucks hauling soil or other loose materials or require all trucks to maintain at least 2 feet of freeboard.
- Pave, apply water three times daily, or apply (nontoxic) soil stabilizers on all unpaved access roads, parking areas, and staging areas at construction sites.

- Sweep daily (with water sweepers) all paved access roads, parking areas and staging areas at construction sites.
- Sweep streets daily (with water sweepers) if visible soil material is carried onto adjacent public streets.
- Hydroseed or apply (nontoxic) soil stabilizers to inactive construction areas (previously graded areas inactive for 10 days or more).
- Enclose, cover, water twice daily, or apply (nontoxic) soil binders to exposed stockpiles (dirt, sand, etc.).
- Limit traffic speeds on unpaved roads to 15 miles per hour.
- Install sandbags or other erosion control measures to prevent silt runoff to public roadways.
- Replant vegetation in disturbed areas as quickly as possible.

Enhanced Control Measures – The following enhanced control measures would be required, as necessary, for use at construction sites due to the nature of the contaminated soils on the site and the project's location near sensitive receptors.

- Install wheel washers for all exiting trucks, or wash off the tires or tracks of all trucks and equipment leaving the site.
- Install windbreaks at windward side(s) of construction areas.
- Suspend excavation and grading activity when winds (instantaneous gusts) exceed 25 miles per hour.
- Limit the area subject to excavation, grading, and other construction activity at any one time.

Impact A-2: Construction-Related Emissions of Ozone Precursors from Terrestrial Equipment and Vehicles. BAAQMD includes construction emissions for ozone precursors in their emissions inventory. An emissions estimate for construction activity was developed to analyze the general conformity of the remedial activities with EPA conformity thresholds, since the remedial action is a federal action. This conformity analysis is presented in Appendix E. The estimate for terrestrial construction activity, which is based on conservative assumptions, identifies that remedial activity could generate emissions up to 3 tons per year of ROG and 40 tons per year of NOx during the busiest year of remedial activity. These amounts are less than the EPA conformity thresholds of 50 tons of ROG and 100 tons of NOx. As discussed in Appendix E, actual annual emissions of ozone precursors are likely to be far less than that estimated, due to the use of conservative assumptions and presumptions that more activity would occur simultaneously than would actually occur. Thus, this is considered a less-than-significant impact.

Section 3.9

Noise

Data Sources

The HAAF Disposal and Reuse EIS (U.S. Army Corps of Engineers 1996), the HWRP EIR/EIS (Conservancy 1998), and the ROD/RAP provided the basis for this discussion.

Environmental Setting

Noise-Sensitive Receptors in the Project Vicinity

Residences, hospitals, libraries, recreation areas, and other similar uses are generally considered sensitive to noise. The existing noise-sensitive uses in the project area are as follows.

- The New Hamilton Partnership commercial and residential development is located adjacent to the HAAF.
- The Bel Marin Keys development is located north of the HAAF parcel and would be within approximately 2,600 feet of the construction area (Pile A).
- Hamilton Elementary School is approximately 6,000 feet (1 mile) southwest of the parcel boundary.

Existing Noise Conditions

Existing noise conditions near the project area are governed primarily by the distance from and the amount of traffic on the local roadways. Roadways near the project or potentially affected by the project include U.S. Highway 101, Nave Drive, Bel Marin Keys Boulevard, Ignacio Boulevard, Main Gate Road, North Hamilton Parkway, and State Access Road. Existing noise levels were estimated for the HAAF Disposal and Reuse EIS. Traffic noise levels were determined using the Federal Highway Administration Traffic Noise Prediction Model (FHWA-77-RD-108).

Table 3.9-1 presents the traffic noise level (day-night average sound level [L_{dn}], the average sound exposure over a 24-hour period), expressed in decibels (dB) at a distance of 100 feet from the centerline of the roadway. Distances to the 70, 65, and 60 dB-L_{dn} traffic noise contours are also summarized in Table 3.9-1. The results indicate that U.S. Highway 101 is the dominant source of traffic noise in the project area.

Existing traffic noise at the sensitive receptors described previously has been estimated based on the traffic noise results presented in Table 3.9-1. The traffic noise at each receptor area varies depending on the proximity of the area to U.S. Highway 101. The existing noise level at the City of Novato (New Hamilton Partnership development) and Bel Marin Keys residential development is 45 to 50 dB-L_{dn}.

Table 3.9-1. Summary of Traffic Noise Modeling for Existing Conditions

Roadway	Segment	L_{dn} at 100 feet from Roadway Centerline	Distance (in feet) from Centerline of Roadway to L_{dn} Contour Line for Existing Conditions		
			70 L_{dn}	65 L_{dn}	60 L_{dn}
U.S. Highway 101 (without soundwall)		77	305	658	1,418
U.S. Highway 101 (with soundwall)[a]		72	142	305	658
Nave Drive	U.S. Highway 101 on-ramps to Bolling Drive	58	–[b]	–[b]	76
	Bolling Drive to Main Gate Road	59	–[b]	–[b]	80
	Main Gate Road to State Access Road	59	–[b]	–[b]	89
	State Access Road to northbound U.S. Highway 101 off-ramp	60	–[b]	–[b]	106
	U.S. Highway 101 off-ramp to Ignacio Boulevard	63	–[b]	72	155
Bel Marin Keys Boulevard	U.S. Highway 101 to Digital Drive	66	54	116	249
Ignacio Boulevard	Freeway ramps to Alameda Del Prado	64	–[b]	90	194
	West of Alameda Del Prado	64	–[b]	83	178
Alameda Del Prado	Ignacio Boulevard to Clay Court	60	–[b]	–[b]	96
	South of Clay Court	58	–[b]	–[b]	69
Bolling Drive	East of Nave Drive	53	–[b]	–[b]	32
Main Gate Road	East of Nave Drive	53	–[b]	–[b]	33
State Access Road	East of Nave Drive	52	–[b]	–[b]	28

[a] A soundwall is located on the east side of the freeway between State Access Road and Main Gate Road and reduces noise by about 5 dB.

[b] Contour line does not extend beyond the edge of the roadway.

Noise Standards and Regulations

Various federal, state, and local agencies have developed guidelines for evaluating land use compatibility under different ranges of sound-levels. The following sections summarize those guidelines.

Federal Guidelines

The federal Noise Control Act of 1972 established a requirement that all federal agencies administer their programs to promote an environment free of noise that jeopardizes public health or welfare. EPA was given the responsibility for

- providing information to the public regarding identifiable effects of noise on public health or welfare,
- publishing information on the levels of environmental noise that will protect public health and welfare within an adequate margin of safety,
- coordinating federal research and activities related to noise control, and
- establishing federal noise emission standards for selected products distributed in interstate commerce.

EPA identified indoor and outdoor noise limits to protect against effects on public health and welfare. Outdoor limits of 55 dB-L_{dn} and indoor limits of 45 dB-L_{dn} are specified as desirable to protect against speech interference and sleep disturbance for residential areas and areas with educational and healthcare facilities.

The U.S. Department of Housing and Urban Development has established guidelines for evaluating noise impacts on residential projects. Sites are generally considered acceptable if they are exposed to outdoor noise levels of 65 dB-L_{dn} or less. They are normally classified as unacceptable if they are exposed to levels of 65 to 75 dB-L_{dn}, and levels of exposure of 75 dB-L_{dn} or greater are always classified as unacceptable.

State Guidelines

In 1987, the California Department of Health Services published guidelines for the noise elements of local general plans. These guidelines include a sound level/land use compatibility chart that categorizes various outdoor L_{dn} ranges by land use. These guidelines identify the normally acceptable range for low density residential uses as less than 65 dB and conditionally acceptable levels as 55 to 70 dB.

Local Guidelines

The Marin County General Plan (1994) establishes noise level performance standards for stationary sources for areas within the county. No stationary noise sources would be associated with the proposed project Marin Countywide Plan Policy N-2.4 requires that measures be taken to minimize the exposure of neighboring properties to excessive noise levels from construction-related activity. Under Program N-2.4a, the Marin County Community Development Department reserves the right to set hours for construction-related activities that involve the use of machinery, power tools, or hammering. The Marin Countywide Plan specifies, in general, that residential areas should not be exposed to sound levels greater than 60 dBA. However, this guidance is primarily concerned with the location of new development, rather than temporary construction noise.

The City of Novato's General Plan (2000) has established noise level performance standards for areas within the city (Table 3.9-2). The city's noise ordinance prohibits noise between the hours of 10:00 p.m. and 6:00 a.m. Although the project site is within the city limits of Novato, the site is not under the City of Novato's jurisdiction. Nevertheless, the proposed transportation route off the site and the adjacent residential development are within the Novato city limits.

Table 3.9-2. City of Novato Noise and Land Use Compatibility Standards

Land Use Category	Maximum allowable noise level
Residential Development	Up to 60 dB
Transient Lodging: Motel and Hotel	Up to 60 dB
School, Library, Church, Hospital and Nursing Home	Up to 60 dB
Auditorium, Concert Hall, Amphitheater	Up to 70 dB
Sports Arena, Outdoor Spectator Sports	Up to 70 dB
Playgrounds, Neighborhood Parks, Open Space	Up to 65 dB
Golf Course, Cemetery	Up to 70 dB
Office Building, Business, Commercial and Professional	Up to 70 dB
Industrial, Manufacturing, Utilities	Up to 70 dB

Source: City of Novato General Plan 2000

Environmental Impacts and Mitigation Measures

Analytical Methods

Noise impacts were evaluated by comparing anticipated noise levels with reference noise levels developed by EPA, the distances to sensitive noise receptors, and local noise guidelines. Noise levels were measured in A-weighted decibels (dBA), a composite frequency-weighting scheme that approximates the way the human ear responds to sound.

Impact Mechanisms

There would be two primary sources of noise related to the proposed project:

- truck traffic hauling excavated material and fill/cover material to and from the project site, and
- construction equipment engaged in excavating, filling, and covering in various locations throughout the project site.

Noise impacts to biological resources are addressed in Section 3.4, "Biological Resources."

As described in Chapter 2, trucks would follow an established route from the north end of the project site around the east side of Landfill 26 to Todd's Road, right (north) on North Hamilton Parkway to Nave Drive, and then either left on Nave Drive to get on southbound Highway 101, or right to get on northbound Highway 101.

Implementation of the ROD/RAP would require the use of heavy construction equipment for those areas identified for excavation and offsite disposal and for areas to be covered by clean fill. Table 3.9-3 lists the noise levels produced by various types of construction equipment. Properly maintained equipment will produce noise levels near the middle of the indicated ranges. Activities such as excavation and hauling of materials and offloading and placing dredged materials may occur throughout the project area, depending on the type of remedial action identified for specific sites. The types of construction equipment used for earthmoving typically generate noise levels of 70 to 90 dBA at a distance of 50 feet when the equipment is operating.

Construction equipment operations can vary from intermittent to fairly continuous use, with multiple pieces of equipment operating concurrently. A worst-case construction scenario may consist of concurrent operation of a bulldozer (87 dBA), a backhoe (90 dBA), a grader (90 dBA), and a front loader (82 dBA) in the same general area. Peak construction-period noise from this combination of equipment would be about 94 dBA from the construction site.

Table 3.9-3. Construction Equipment Noise Emission Levels

Equipment	Typical Noise Level (dBA) 50 ft from Source
Air Compressor	81
Backhoe	80
Compactor	82
Concrete Mixer	85
Concrete Pump	82
Crane, Derrick	88
Crane, Mobile	83
Dozer	85
Generator	81
Grader	85
Impact Wrench	85
Jack Hammer	88
Loader	85
Paver	89
Pneumatic Tool	85
Pump	76
Rock Drill	98
Roller/Sheep's Foot	74
Scraper	89
Shovel	82
Truck	88

Source: Federal Transit Administration 1995.

Table 3.9-4 summarizes noise levels as a function of distance from an active construction site with the previously described equipment in operation. Episodes of noise levels greater than 60 dBA will occasionally occur at locations within about 1,900 feet of a construction site. Episodes of noise levels greater than 70 dBA will occur at areas within about 750 feet of a construction site.

Table 3.9-4. Estimated Noise near a Construction Site

Distance Attenuation		Distance to dBA Contours	
Distance to Receptor (feet)	Sound Level at Receptor (dBA)	Sound Level at Contour (dBA)	Distance to Contour (feet)
50	94	95	45
100	88	90	79
200	82	85	138
400	75	80	240
600	72	75	417
800	69	70	736
1,000	67	65	1,115
1,500	62	60	1,918
2,000	59	55	2,902
2,500	56	50	4,006
3,000	54	45	5,365
4,000	50	40	7,407
5,280	46	35	8,074
7,500	39	30	8,801

The following assumptions were used:
Basic sound level dropoff rate: 6.0
Atmospheric absorption coefficient: 0.5
Reference noise level: 94
Distance for reference noise level: 50
Notes:
Calculations include the effects of atmospheric absorption at a dropoff rate of 0.5 dB/100 meters. The effects of local shielding from buildings and topography are not included and will substantially reduce sound levels.
Except for sounds with highly distinctive tonal characteristics, noise from a particular source will not be identifiable when its level is substantially less than background noise levels.

Thresholds of Significance

According to CEQA Guidelines and professional judgment, a project is considered to have a significant noise impact if it would

- increase noise levels to 60 dBA, or
- increase noise levels by 3 dBA in areas where noise levels already exceed 60 dBA.

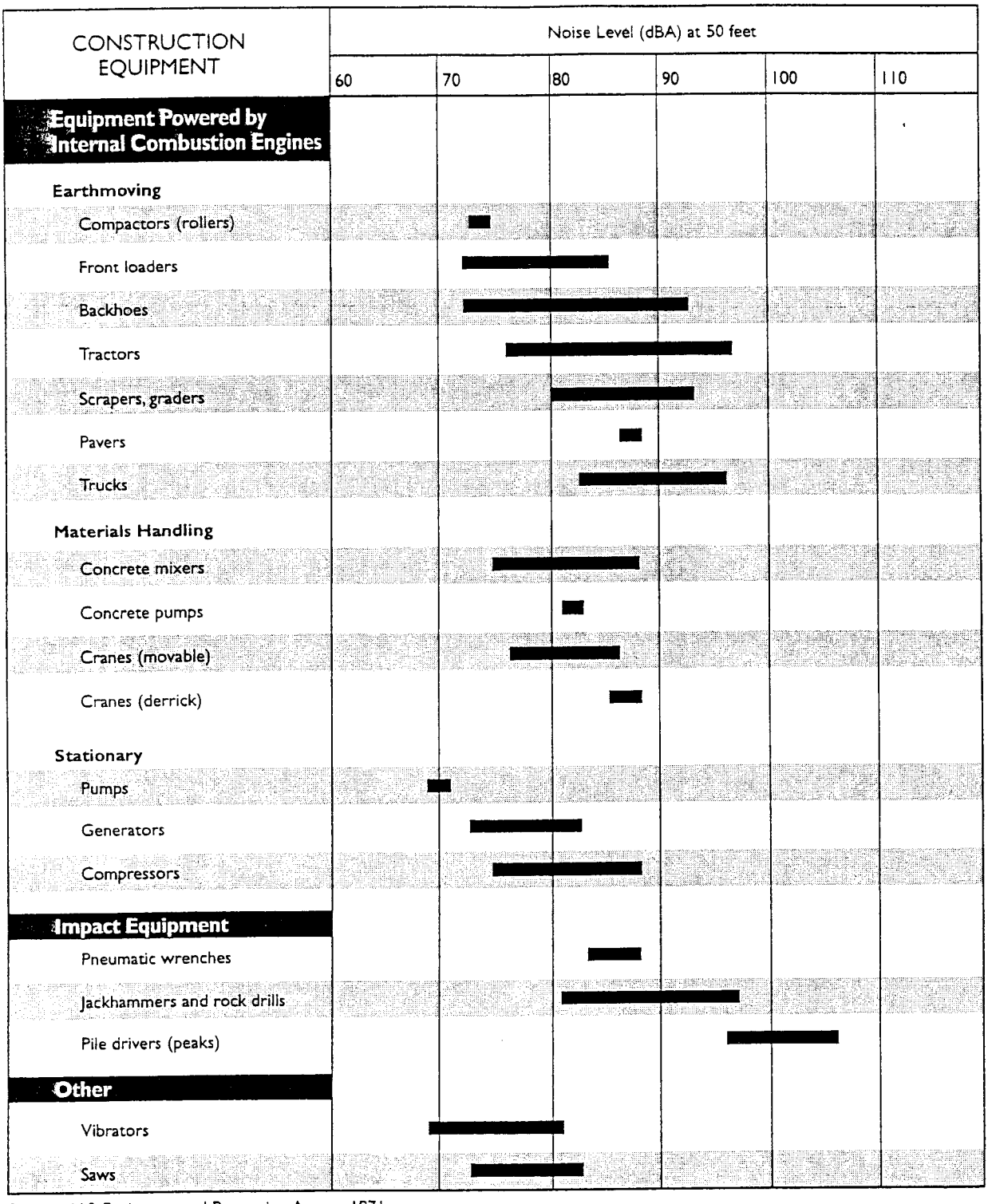
Impacts and Mitigation Measures of the Proposed Project

Impact N-1: Potential Increases in Traffic Noise Levels. Implementation of the project would result in increases in traffic associated with excavation, disposal, and fill activities at the project site. As indicated in Section 3-7, "Transportation," most traffic associated with site clean up would be routed over the proposed access route along Todd Road, North Hamilton Parkway, and Nave Drive (Figure 3.9-1). These activities would generate a low number of daily trips by both construction workers and trucks hauling excavated material and fill/cover material and would not significantly affect noise conditions in the area crossed by the proposed access easement. The impact on sensitive noise receptors as a result of increased construction traffic is considered less than significant.

Impact N-2: Temporary Increases in Noise Levels to More Than 60 dBA during Construction. As described in the discussion of impact mechanisms above, implementation of the proposed action would result in noise levels exceeding 60 dBA at distances as great as 1,900 feet from excavation and other earthworking activities. Sensitive noise receptors within 1,900 feet of construction areas include the New Hamilton Partnership residential and commercial property. The Bel Marin Keys residential area is located more than 1,900 feet from the nearest proposed construction site and noise effects would, therefore, be below the 60 dBA threshold. Although temporary, this impact would be considered significant, requiring mitigation to reduce it to a less-than-significant level.

Mitigation Measure N-1: Employ Noise-Reducing Construction Practices. To reduce noise levels to the maximum extent practicable, the remediation contractor will employ the following noise-reducing construction practices.

- During construction phases, the contractor will ensure that construction is performed in accordance with City noise standards.
- During construction phases, noise generating activities within 300 feet of an occupied residence will only be performed during normal daylight hours (6:00 a.m. to 10:00 p.m.), Monday through Saturday, wherever feasible.
- Mufflers should be kept operable and effective on all construction equipment, generators, and vehicles. All internal combustion engines must be operated with exhaust and intake silencers. Wherever possible, noise-generating construction equipment should be shielded from nearby residences by noise-attenuating buffers such as structures or truck trailers.



Source: U.S. Environmental Protection Agency 1971.

Jones & Stokes

Figure 3.9-1
Construction Equipment Noise Ranges

- Prior to construction within 1,000 feet of residences, written notice should be provided to potentially affected residences identifying the type, duration, and frequency of construction activities. Notification materials will also identify a mechanism for residents to register complaints if construction noise levels are overly intrusive or construction occurs outside the required hours.

- Construction staging area(s) and stockpile areas will be located at least 1,000 feet from occupied residences, or contractors will be required to provide appropriate noise-reducing engine-housing enclosures. Equipment warm-up areas, water tanks, and storage areas should be located in the established staging area or in other portions of the site more than 1,000 feet from existing residences, as feasible.

- Throughout the construction period, the contractor will implement appropriate additional noise mitigation measures, including, but not limited to, changing the location of stationary construction equipment, shutting off idling equipment, rescheduling construction activity, or installing temporary barriers around stationary construction noise sources at the request of the City.

Section 3.10

Cultural Resources

Data Sources

Both the inventory of resources and analysis of project impacts contained in this section are derived from the 1998 HWRP EIR/EIS. The cultural resources analysis contained therein was based on the HAAF Disposal and Reuse EIS (U.S. Army Corps of Engineers 1996), which summarizes information obtained from

- National Register of Historic Places Evaluation of Eight Buildings on Hamilton Army Airfield, Marin County, California, Final Report (PAR Environmental Services 1993a);
- Hamilton Army Airfield Historic District Historic Resources Inventory Forms (PAR Environmental Services 1993b);
- National Register of Historic Places Evaluation, Hamilton Army Airfield Historic District, Marin County, California (Draft) (PAR Environmental Services 1993c);
- National Register of Historic Places Registration Form, Hamilton Army Air Field Historic District, Novato, California (PAR Environmental Services 1994); and
- National Register of Historic Places Registration Form, Hamilton Army Air Field Discontiguous Historic District, Novato, California (PAR Environmental Services 1998).

Environmental Setting

Prehistory of the Area

The project area is located in the former territory of the Coast Miwok, who have inhabited Marin and Sonoma Counties from approximately 5,000 years ago and who live there today. Early inhabitants relied heavily on the resources associated with San Pablo Bay and associated marshes and estuarine environments. Several archaeological sites associated with past use are found near the project area and generally inland of the project site; most are situated above the historic

marshlands. The Coast Miwok village of Puyuku is situated within 1 mile of the project site.

Historic Background

The earliest Coast Miwok contact with Europeans is presumed to have occurred in the late 1500s with the voyages of Drake and Cermeno. Missionization, beginning in the late 1700s, forced Native Americans to convert to Christianity, resulting in population displacement and cultural disintegration. Epidemics further reduced native populations.

After Mexico gained its independence from Spain, a series of land claims were granted to the Californios (California citizens of Mexican descent). Rancho San Jose, which contains the HAAF parcel, was granted to Ignacio Pacheco. Livestock grazing associated with the rancho was the predominant agricultural pursuit at that time. With railroad development in the 1870s, Novato and Ignacio became viable agricultural communities. Levee construction and land reclamation in the 1890s increased agricultural options.

HAAF was constructed between 1931 and 1935, specifically as a bombardment base. As one of three such bases in the United States at the time, the airfield played a vital role in the development of air defense mechanisms on the West Coast in the 1930s and in the training and processing of units during the early 1940s.

The use of a Spanish Eclectic architectural style represented a departure from the traditional military approach to base construction, increasing the base's importance. The craftsmanship evident in the original buildings found on base, and the overall layout and landscaping, are also significant. More generic-style temporary buildings that are characteristic of construction methods used during World War II are also found at HAAF.

In 1993, the significance of HAAF was evaluated against the criteria established for the National Register of Historic Places (NRHP) and found to be eligible as a historic district (PAR Environmental Services 1993c). This research has determined that the most significant phase of historical activity at HAAF occurred between the years 1931 and 1946. The boundaries of a historic district were established accordingly to include all areas of the military reservation active during that period.

Within the period of significance for the Hamilton Historic District are two distinct architectural and historical phases: 1931 to 1935 and 1938 to 1946. Between 1931 and 1935, the permanent facilities were constructed and the post was established as a vital component of West Coast air defense. Between 1938 and 1946, the air base underwent a period of dramatic expansion to serve as a staging area for World War II air transport and a postwar reentry facility.

Regulatory Setting

When the Army was directed to dispose of the HAAF, it was obligated to comply with Section 106 of the National Historic Preservation Act of 1966, as amended, and its implementing regulations, 36 CFR Part 800. Compliance with Section 106 requires historic properties (including archaeological, historical, and architectural resources) to be inventoried and evaluated for their eligibility for listing on the NRHP.

The Army's compliance with Section 106 for the Hamilton Army Airfield Historic District was directed by two memoranda of agreement (MOA). The first MOA was executed in April 1994 between the Army, General Services Administration, Advisory Council on Historic Preservation, and State Historic Preservation Officer. The MOA covered the effects of conveyance of the outparcels on historic properties. Subsequently, another MOA was executed between the Army, Advisory Council on Historic Preservation, and State Historic Preservation Officer regarding the effect on historic properties of the disposal and reuse of the BRAC parcels.

Summary of Cultural Resource Investigations

The results of previous studies in the area of potential effects (APE) for the proposed project are described below. As described below, the APE for the proposed project includes the APE studied for the 1998 HWRP EIR/EIS, as well as the additional area CSM adjacent to San Pablo Bay.

Archaeological Studies

Numerous archaeological investigations have been conducted within the boundaries of the Hamilton installation (Archaeological Consulting and Research Services 1979a, 1979b; Archaeological Resource Service 1991; Baker and Salzman 1980; Chavez 1986; Desgrandchamp and Clark 1978; Flynn 1978; PAR Environmental Services 1989). Portions of the APE for the project have been surveyed. Unsurveyed portions of the APE are fill, with little or no potential to contain cultural resources. No known archaeological sites were found on any of the parcels subjected to disposal and reuse (Archaeological Consulting and Research Services 1979a, 1979b; Chavez 1986).

Architectural Studies

HAAF has been the subject of numerous architectural investigations. In 1993, the research culminated in a complete inventory of the site (PAR Environmental Services 1993b) and the preparation of a determination of eligibility (DOE) report (PAR Environmental Services 1993c) and draft NRHP nomination for the

Hamilton Army Airfield Historic District (PAR Environmental Services 1993d). The DOE report presents the historical context for the air base, a thorough documentation of the cultural landscape at HAAF, and the evaluation of the district's eligibility for listing on the NRHP as specified in 36 CFR 60.4.

In April 1998, PAR Environmental Services conducted a reevaluation of the DOE and prepared the NRHP registration form for the Hamilton Historic District (PAR Environmental Services 1998). The result of this reevaluation was a reduction in the area encompassed by the district. The district boundaries are currently outside the footprint of the proposed wetland restoration project.

Disposal and reuse of HAAF was determined to have an adverse effect on the integrity and research potential of the historic district as a whole. To mitigate this impact, the Army is implementing mitigation measures stipulated in the MOA for other Army actions, namely the conveyance of the outparcels and BRAC parcels. These mitigation measures include preparing historical documentation, developing two video productions on the history of the former HAAF, completing a nomination to the NRHP, preparing a museum interpretive plan and brochure for the Novato Historical Guild, and preparing written and photographic documentation of the historic district for submittal to the Library of Congress, in accordance with the requirements of the Historic American Building Survey. (PAR Environmental Services 1998)

To further mitigate the transfer of historic properties, the Army has developed an interpretive display to illustrate to the public the history and significance of the district. This exhibit includes a transportable modular display, interpretive materials illustrating the historical and architectural significance of Hamilton Historic District, and a portable television and videocassette recorder for viewing the videos. The exhibit was designed to be presented at professional meetings, Army functions, and in other public venues, including the Novato Historical Guild.

To supplement historical research conducted to date, the Army is conducting oral history research to document the experiences of personnel formerly stationed at the installation. This information will be used as part of both the Novato Historical Guild's museum and the Army's mobile interpretive display.

Summary of Cultural Resources in the APE for the Proposed Project

For the purposes of the 1998 HWRP EIR/EIS, the HAAF parcel was surveyed for cultural resources, and no known prehistoric or historic archaeological resources were present (Archaeological Consulting and Research Services 1979a, 1979b; Chavez 1986; Environmental Science Associates 1993). No portions of the proposed revised Hamilton Historic District are within the APE for the HWRP (PAR Environmental Services 1998).

Although the potential for these parcels to contain prehistoric or historic resources is considered low, resources may exist beneath the surface. The 1998 APE did not include the outermost portion of the coastal salt marsh area wherein some of the proposed remedial actions would occur (e.g., the outfall drainage ditch, east levee construction debris disposal area burn pit, the former sewage treatment outfall, and a portion of the high marsh non-channel cut area). It is assumed that this portion of the project area is the same as coastal salt marsh that was included in the 1998 APE and that the potential for occurrence of prehistoric resources is low.

Environmental Impacts and Mitigation Measures

Thresholds of Significance

CEQA defines a significant historical resource as "a resource listed or eligible for listing on the California Register of Historical Resources" (Pub. Res. Code, Section 5024.1). For a historical resource to be eligible for listing on the California Register of Historical Resources, it must be significant at the local, state, or national level under one or more of the following four criteria:

1. It is associated with events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the United States;
2. It is associated with the lives of persons important to local, California, or national history;
3. It embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of a master or possesses high artistic values; or
4. It has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California, or the nation.

Historical resources automatically listed on the California Register of Historical Resources include those historic properties listed on, or formally determined eligible for listing on, the NRHP.

Based on archival research and field investigations, the project area does not appear to have a high potential for the inadvertent discovery of archaeological resources, and no significant architectural resources are known to exist on site. Therefore, it is not expected that any cultural resources would be affected with implementation of the proposed project. Because remediation activities would involve ground disturbance, however, the project may result in impacts to previously undiscovered archaeological resources.

Impacts and Mitigation Measures of the Proposed Project

Impact CR-1: Potential Impacts to Buried Cultural Deposits or Human Remains. Remedial activities may encounter unexpected buried cultural deposits or human remains. This impact is considered potentially significant. To reduce this impact to a less-than-significant level, the following mitigation measures would be implemented.

Mitigation Measure CR-1: Stop Work if Buried Cultural Deposits Are Encountered during Remedial Activities. If buried cultural resources, such as chipped stone or groundstone, historic debris, building foundations, or human bone, are inadvertently discovered during ground-disturbing activities, work will stop in that area and within a 100-foot radius of the find until a qualified archaeologist can assess the significance of the find.

Mitigation Measure CR-2: Stop Work if Human Remains Are Encountered during Remedial Activities. If human skeletal remains are encountered, the county coroner will be contacted immediately. If the county coroner determines that the remains are Native American, the coroner will then be required to contact the Native American Heritage Commission (NAHC) (pursuant to Section7050.5 (c) of the California Health and Safety Code) and the County Coordinator of Indian Affairs. A qualified archaeologist will also be contacted immediately.

If any human remains are discovered in any location other than a dedicated cemetery, there will be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent human remains until

- the county coroner has been informed and has determined that no investigation of the cause of death is required; and if the remains are of Native American origin,
  - the descendants from the deceased Native Americans have made a recommendation to the landowner or the person responsible for the excavation work for means of treating or disposing of, with appropriate dignity, the human remains and any associated grave goods as provided in Public Resources Code Section 5097.98; or
  - the NAHC was unable to identify a descendent or the descendent failed to make a recommendation within 24 hours after being notified by the commission.

According to the California Health and Safety Code, six or more human burials at one location constitute a cemetery (Section 8100), and disturbance of Native American cemeteries is a felony (Section 7052). Section 7050.5 requires that construction or excavation be stopped in the

vicinity of discovered human remains until the coroner can determine whether the remains are those of a Native American. If the remains are determined to be Native American, the coroner must contact the NAHC.